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STRESS AND PERSONALITY HARDINESS AS RELATED TO GENDER IN STUDENT SELECTION OF A COLLEGE MAJOR

by

Kathryn M. Kash

A dissertation submitted to the Graduate Faculty in Psychology
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy, The City University of New York

1987

This manuscript has been read and accepted for the Graduate Faculty in Psychology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

April 28, 1987
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Morton Bard
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Abstract

STRESS AND PERSONALITY HARDINESS AS RELATED TO GENDER IN STUDENT SELECTION OF A COLLEGE MAJOR

by

Kathryn M. Kash

Adviser: Professor Morton Bard

The purpose of the present study was to explore the relationship between stressful life events, hardiness and psychological impairment in college sophomores and juniors who chose majors that are considered typical (traditional) or atypical (non-traditional) for their gender. 163 males and females were administered a questionnaire which obtained demographic information and included measures of stressful life events, hardiness, anxiety and depression.

The data were analyzed according to the sex and major of the subject as well as whether their major was gender typical or atypical. Although significant correlations were found between stressful life events and psychological impairment, confirming earlier research, ANOVA failed to show a significant main effect between these variables. However, a significant main effect of hardiness on psycholgical impairment was found. Regression analyses revealed a significant interaction between stressful life events, hardiness and one measure of depression. This last finding supports previous work indicating that hardiness acts as a stress-resistance factor in the stress-illness process.

While there were no significant main effects for major or gender on hardiness there was a significant interaction effect between major and gender. Overall, students who chose gender atypical majors were significantly hardier than students who major in traditional fields. When looking at major and gender and psychological impairment, an ANOVA revealed a significant main effect of gender on psychological impairment. Females who major in gender typical areas were significantly more depressed and anxious than was any other group.

The theoretical significance of these results are discussed from the existentialist point of view and in terms of sex-role stereotype behavior and how these factors influence vocational choice. References are made to theories regarding depression in women with particular emphasis on those women who chose traditional paths. Directions for future research include investigations of 1) personality hardiness with the cognitive style of field dependence—field independence, 2) hardiness and achievement, 3) individual and categorical stressful life events for gender typical and atypical majors, and 4) the developmental process of hardiness from high school through college.

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Chapter 1

INTRODUCTION

Overview of the Problem

During the past two decades there has been an increasing interest in the relationship between stressful life events and both physical and psychological impairment (Dohrenwend and Dohrenwend, 1974; Dohrenwend and Dohrenwend, 1978; Gunderson and Rahe, 1974). Despite promising and prolific research in this area, studies typically have demonstrated low to modest, albeit statistically significant, corrrelations between life events and illness (Rabkin and Struening, 1976). One strategy for dealing with these rather poor associations has been to further refine the methodological issues and strengthen stressful life events measures. This approach suggests an important way through which the stress-illness significance may be increased. While stressful life events measures will be explored, their shortcomings detailed, and the rationale for the life events measure used will be included, this strategy is not the focus of this research.

Another strategy has been to investigate moderator or intervening variables, that is, those variables that ameliorate the deleterious effects of stressful life events. Recent research has investigated potential moderator variables for the stressful life events and psychological impairment relationship such as social support (Sandler

and Lakey, 1982), locus of control (Johnson and Sarason, 1978), hardy personality style (Kobasa, 1979), and sensation seeking (Smith, Johnson and Sarason, 1978). In the past five years, one of these moderator variables, a hardy personality style, has emerged as a stress-resistant factor in the stress-illness process. This personality style has been shown to moderate stressful life events by significantly reducing the physical illness effects. Hardiness also functions with other intervening variables such as social support (Kobasa and Puccetti, 1983) and exercise (Kobasa, Maddi, and Puccetti, 1982) to moderate the stress-illness relationship.

While this individual resource has acted as a stress buffer for successful business executives and other professional groups (lawyers and Army officers), these populations have been men in the middle to upper age range. There has been only one study using women (Kobasa, 1982a) and there have been no reported studies investigating younger populations. It would be particularly interesting to examine college students who are not yet successful in a profession but have only chosen a major area of specialization. Looking at college students presents an opportunity to investigate this moderator variable in a population whose life stressors are quite different from successful professionals. In addition, research with students would involve comparing non-professional women and men who are similar in demographics, environment and life stage and on several other variables.

In order to conduct research with a college student population and examine personality style as a coping strategy for dealing with stressful life events, other factors bear some consideration. One needs to think about the sex-role socialization that takes place in the developmental process of a student's life. Traditionally, college students choose academic areas of specialization that are compatible with their sex-appropriate social roles. That is, men choose majors such as business or engineering in preparation for their role as the "breadwinner" in the family. On the other hand, women choose areas such as education or nursing in preparation for the wife/mother role.

With a shift in the selection of majors as well as careers over the past twenty years (e.g., women in business and men in nursing), what characteristics does a student need in order to pursue a gender atypical (non-traditional) major? When one looks at the characteristics of the hardy personality style—committment, control and challenge—one can speculate that these may be essential for selecting and completing an atypical major in college. It can be reasoned that choosing an atypical major is contrary to the social norms, and therefore those students who do so may view this change in what is considered to be typical behavior as a challenge for them. Students in atypical majors may also feel a greater sense of committment to their studies then students who follow the typical gender path in college. And, these students may be more able to influence what happens to them and master their course in

college.

If students who choose atypical majors are indeed hardier than those who are in typical (traditional) majors, it is likely that there may be gender differences as well as category (typical or atypical major) differences. In other words, it is possible that men in social science/humanities may be hardier than men in science/mathematics and women in social science/humanities. Also, women in science/mathematics may be hardier that women in social science/humanities and men in science/mathematics. This is not to say that women will be hardier than men or vice-versa, but the differences will lie within the selection of a typical or atypical major for each gender. If these gender differences for a hardy personality style in typical and atypical majors are indeed found, then does this style help students to cope with stressful life events and ameliorate the resultant psychological impairment?

The purpose of the present study is to investigate the role of hardiness as a moderator of the stressful life events-psychological impairment relationship in college students. In addition, the major course of study which a student selects, i.e. social science/humanities versus science/mathematics, may contribute to the manifestation of stress-induced psychological impairment. Research has indicated that students who are in social science/humanities disciplines report more psychological impairment than students who major in

science/mathematics areas (Bereiter and Freedman, 1962). Moreover, the congruence between one's gender and a selected major may be an important variable, particularly if the chosen major is contrary to the social norm for the student's gender . If a student does choose an atypical major, what is the role of the hardy personality style for these students? These variables will be investigated within the theoretical framework of stressful life events, existentialism and the hardy personality, as well as sex-role socialization and gender differences and their impact on psychological impairment, i.e. anxiety and depression, of college students.

Chapter 2

STRESSFUL LIFE EVENTS

Early Research

Enough is known about stress and the mental causes of somatic illnesses to suggest that psychophysiological disorders may originate in our emotions and thoughts (Lazarus, 1966; Theorell and Rahe, 1971). The notion of stress, so brillantly developed by Selye (1956), and its relationship to illness was further advanced by Holmes and Rahe (1967), who concluded that a series of events requiring change in ongoing life adjustment is significantly associated with onset of illness. Holmes and Rahe based their research on ideas evolving from Adolph Meyer's psychobiosocial theories, from his invention of the "life chart", and from his concept of psychiatric disorders as "reactions". Thus, according to Holmes and Rahe, stress occurs not only when an individual is directly threatened, but also when any environmental change occurs, regardless whether an observer judges it to be positive or negative.

The changes to which Holmes and Rahe referred were constructed in a measurement instrument, the Social Readjustment Rating Scale (SRRS). A list of 43 events, including divorce, trouble with the boss, vacation, promotion on the job, death of a spouse, birth of a child, etc., was given to 394 subjects who were asked to assign a rating to each event based on the degree of readjustment necessary in terms of both

the intensity of the event and the length of time needed for recovery, irrespective of the desirability of the event. [1]

"Marriage", given the arbitrary value of 500, was offered as the reference event. The subjects were instructed to use whatever knowledge they had, whether it be based on their own personal experience or the experiences of others, in arriving at the value. Means were then calculated for each event. The Schedule of Recent Experiences (SRE) consisting of these events was then administered to a different group of subjects, who marked off how many times each event occurred within a given period of time (e.g. six months, ten months, one year, etc.). The number of times an event occurred was multiplied by the mean value for each event for each respondent. These products were then summed yielding a total life change unit (LCU) (Casey, Masuda, and Holmes, 1967). This method has been the basis for most of the subsequent research on stressful life events and illnesses.

A critical factor in linking life change events with psychological impairment is how an event is defined as stressful. As stated above,

[1]Other researchers investigating stress and disease focus only on those life events with negative consequences. (see, for example, Brown and Birley, 1968).

Holmes and Rahe view change as the important factor and their study revealed that those with higher life change scores did indeed suffer a greater amount of subsequent illness. In fact, Holmes and Rahe conclude that the cause of illness is not to be found in any specific, clear-cut event but rather in the cumulative effect of too many stressors occurring in too short a period of time, i.e., before the individual has had a chance to adapt, cope, and/or recover from earlier presenting ones. This research method has indeed found that stressful life events play a role in the etiology of physical illnesses(Holmes and Masuda, 1974). Among the physical disorders associated with stressful life events are myocardial infarction(Theorell and Rahe, 1971), sudden cardiac death (Rahe and Lind, 1971), and tuberculosis (Hawkins, Davies, and Holmes, 1957). In fact, hundreds of studies done have shown an increase in life change units leads to an increase in subsequent illness in such a manner that if an individual has less than 150 LCU's s/he will remain healthy and if the LCU's are over 300 than the individual has a 70% chance of at least one illness occurring in the next year.

There have been some criticisms of the Holmes and Rahe scaling method. Dohrenwend and Dohrenwend (1978) suggest that both subjective events, such as sexual difficulties, and objective events, such as being fired from work, may not be the precipitating factor in stress but "...are more likely to be manifestations of or responses to underlying pathology" (p.9). They emphasize the importance of dating

the event and onset of symptoms to determine any causal inference. Another criticism was that the stressful life events scale measured only the quantity of change without referring to the quality of these changes. Subsequent research has investigated the control which the individual has over the events (Dohrenwend, 1973), how socially desirable the events are (Vinokur and Selzer, 1975; Johnson and Sarason, 1978), whether the events are entrances or exits from the social field (Myers, Lindenthal, Pepper, and Ostrander, 1972; and Paykel, 1974), and the predicability of the events (Dohrenwend and Dohrenwend, 1978). These theoretical and empirical perspectives have allowed stressful life events to be viewed in a multidimensional context, however, sometimes the classification system seems arbitrary (see reference on page 14 to Schroeder and Costa, 1984).

Extensive investigation has strongly supported the notion that there is a significant relationship between stressful life events and psychological impairment. Holmes and Holmes (1970) observed that here too, the quantity of events was significantly related to impairment; however, the quality of events was also found to be of importance.

The research of Paykel, Myers, Dienelt, Klerman, Lindenthal, and Pepper (1969) is one of the most interesting in relation to the theme of life events and psychological impairment, particularly depression. In a carefully controlled study of 185 depressed patients and 938 healthy subjects of the same community, the investigators examined two

questions: Are life events more frequent just prior to the onset of depression and, if so, are all life events more frequent or only certain types? The results allowed them to identify two categories of events: (1) entrances- changes in the social field involving an "addition" e.g., birth of a child, marriage, engagement, a person moving in and the like; and (2) exits- changes in the social field involving a "loss" e.g., death, divorce, separation , a child moving out and so forth. Further observed was that certain events are generally perceived by American society as undesirable, although both types clearly constitute change. Their findings demonstrated that there is an excessive number of life event changes prior to the onset of depression, with those events regarded as undesirable and those involving exits particularly distinguishing the depressed patients from the controls. These data have been supported by others (Myers, Lindenthal, and Pepper, 1971; Myers, Lindenthal, Pepper, and Ostrander, 1972; Jacobs, Prusoff, and Paykel, 1974; Vinokur and Selzer, 1975) who have also found that undesirable events, preceding the onset of illness, are significantly greater for the psychiatrically impaired individual.

Although a different scaling method was used, the findings of Paykel, Prusoff, and Uhlenhuth (1971) paralleled those of Holmes and Rahe (1967). They gave a list of 61 events to 373 subjects who were to rate on an equal interval scale ranging from 1 to 20 how upsetting each event would be for the average person. Like the Holmes and Rahe

subjects, the group was instructed to rely on whatever sources of information they had, regardless of its origin, in arriving at a score for each event. After completing this task, the subjects were asked to go over the list once again and place an X next to any event that had happened to them within the past year. Paykel et al found high correlations between the mean scale scores of the different psychiatric patient groups suggesting that the perceived degree of severity of the different life events is similar across populations. Examining the incidence of events, Paykel et al found differences between patient groups: day-patients and in-patients had higher scores than did out-patients. This was attributed to the more severe psychiatric disturbances among the first two groups of patients. Paykel et al than compared 14 items on their scale to analogus items on the Holmes and Rahe (1967) questionnaire. The correlation between the mean scores for the two subscales was 0.683. Thus, it would seem that a scale using a fixed value (e.g. Holmes and Rahe) will yield results that are relatively comparable to an equal interval scaling method (e.g. Paykel et al) when its item content is similar.

Methodological Problems

There are several methodological problems that must be addressed before a causal relationship between stressful life events and impairment can be accepted. These difficulties include: (1) normative vs. idiographic measures; (2) the content, ambiguity and subjectiveness

of some events; (3) dating the event in terms of the onset of symptoms; and (4) the effects of time on recall in retrospective studies.

Both the normative and idiographic approaches have their supporters. Normative measures (also sometimes referred to as consensus measures) were used by Holmes and Rahe (1967) and are strongly advocated by Dohrenwend, Krasnoff, Askensay, and Dohrenwend (1978). The normative method employs mean rating values, obtained from an independent sample, as the weights for stressful life events for the sample under investigation. Idiographic measures like those used by Sarason, Johnson, and Siegel (1978), have the subject rate each stressful life event that has occurred to them on some dimension, such as readjustment , anticipation, control, desirability/undesirability, or positive/negative outcome. The weight assigned to each event, therefore, is based on the individual's subjective perception of the event and incorporates that individual's predispositions, e.g., psychological defenses, sensitivities, etc. into the rating. As might be expected, this type of rating yields a stronger relationship to the outcome variable(s) than does the normative method (Vinokur and Selzer, 1975; Theorell, 1974). According to Dohrenwend et al (1978) though, where an idiographic measure "...may be useful for understanding and treating individual cases, it is not a clean measure of environmental input in the stress process" (p.206). That is, the value assigned to any particular stressor will not be a pure

measure of the impact of that event but rather is confounded by other subject variables, making it difficult to unravel the causal relationship between stress and illness. In studies using idiographic measures, there may be content overlap between the rating of a stressful life event and subsequent illness. This has the potential for confounding the data results. While this may be true for retrospective studies, idiographic ratings could be a useful measure for prospective studies.

The content, ambiguity and subjectivity of the listed events are also important factors that should be considered. Are all events stressors or are only those considered undesirable the better predictors of illness? Holmes and Rahe (1967) and Dohrenwend (1973a) saw all events, positive and negative, requiring some type of change as potential stressors. Dohrenwend later expanded her position to include both the anticipation of an event and control over the occurrence of that events as important factors in investigating stressful life events (Dohrenwend and Dohrenwend, 1978). Other investigators as mentioned earlier (Vinokur and Selzer, 1975; Jacobs et al, 1974) saw only undesirable events as significantly greater among the psychologically impaired. Another issue regarding the content of the events concerns the validity for a given population. If any inferences regarding the outcome of stressful events are to be made, the events used should be applicable to the sample to be studied (Rabkin and Struening, 1976). The age and gender of the subjects, as well as their ethnic, cultural and

socioeconomic backgrounds may determine the type, frequency, and evaluation of experienced events. Using the original Holmes and Rahe measure would not be appropriate for a high-risk college student population as it does not reflect the events (e.g. academic) which would be stressful for them. It is important to add or delete items appropriately; for example, events such as retirement, menopause and finished school, should not be used in an investigation sampling college students.

Items previously designated as ambiguous (Miller, Bentz, Aponte, and Brogan, 1974; Dohrenwend et al, 1978), i.e. unclear in whether they were positive or negative , need to be expanded and/or subdivided so their intent is clear to the subject. For example, "major change in living conditions of family" could be expanded by adding on "building new home, remodeling, deterioration of home and/or neighborhood, etc." To subdivide this event, two other events could be added: "moved to a better residence", and "moved to a less attractive residence". Another example, "major change in working conditions" might be expanded by including, "differences in work responsibility, working hours, etc." Additional items such as "demoted at work", promoted at work", laid off from job", and "changed jobs"- would indicate whether the events are positive or negative and may be assigned different values by the judges.

Questions have been raised by some researchers (Hudgens, 1974; Rabkin and Struening, 1976; Schroeder and Costa, 1984) regarding the

contamination of health outcomes by events which are subjective in nature. In other words, some events are related to physical health (e.g., major personal injury or illness), and others to subjective judgment (e.g., outstanding personal achievement). Schroeder and Costa (1984) found that contaminated events are correlated significantly more with illness than are uncontaminated or objective events. Three judges divided events into contaminated (physical health, subjective, and neurotic) and uncontaminated and while the categories are presented in the Schroeder and Costa paper, the rationale for including an event in one category vs. another is never clearly specified, leaving the reader somewhat perplexed as to the criteria used in classifying events. For example, marriage and major change in the health or behavior of a family member are contaminated events, becoming engaged and severe illness or injury to an immediate family member are uncontaminated, and being fired from a job is classified as a neurotic behavior.

Dohrenwend, Dohrenwend, Dodson, and Shrout (1984) found that 19%, or eight items, of Holmes and Rahe's (1967) 42 items (Christmas item deleted) were confounded in that they were as likely to be a symptom of psychological distress as they were a cause of it (Dohrenwend and Dohrenwend, 1978; Paykel et al, 1969; Jacobs et al, 1974; Myers et al, 1971; Hudgens, Morrison, and Barchha, 1967 also agree). And sadly, the Holmes and Rahe questionnaire was the least confounded instrument of those Dohrenwend et al (1984) investigated.

Hudgens (1974) has found that 29 out of 43 events on the Holmes and Rahe (1967) list "...are often the symptoms or consequences of illness" (p.131). For example, an individual may become depressed and subsequently lose his/her job rather than the individual losing the job with subsequent depression. Thus, an important consideration in the stress-illness cycle involves dating the events relative to symptom onset. The results of any retrospective study that ignores dating the onset of events to before the beginnings of symptomatology may be seriously confounded. Furthermore, the effects of time per se must also be acknowledged in retrospective studies. That is, how far back in time is it reasonable to go before the effects of memory distortion and/or forgetting affect the reporting of events? Most researchers (Paykel et al, 1969; Dohrenwend, 1973a&b; Myers et al, 1972; Casey et al, 1967; Brown, 1972; Jacobs et al, 1974; Vinokur and Selzer, 1975) have looked at events occurring within the last year prior to questionnaire administration. Brown (1972) found that any significant differences uncovered between patient and comparison groups when more recent intervals were examined disappeared only when a period of time longer than 12 months was investigated. Myers et al (1972) found there was no difference in the number of events reported when a year was divided into two successive six month periods. Finally, Casey et al (1967) found "...that it takes a period of time greater than nine months to affect the magnitude of recall" (p.244).

Most of the data analyses of stressful life events and physical and psychological illnesses are usually t-tests of differences between the means or percentages. When correlational analyses are reported values range from .20 to .29. Thus, only about 4 to 9% of the variance in illness (Rabkin and Struening, 1976) can be accounted for by stressful life events indicating that other variables are involved in the stress-illness relationship.

The above section has pointed out some of the difficulties conducting research using stressful life events measures in both prospective and retrospective designs. Given that the recall question suggests that there is good reliability up to nine months after an event occurs, this study used a retrospective design asking college students to check off events that happened to them in the past seven months. The normative method for assessing these life events (objective weights assigned to checked off events) appears to be the most appropriate way for finding a relationship between stress and psychological impairment. In addition, the stressful life events were geared to the specific population at hand, namely college students. While categories of events as well as individual events are important considerations, for the purposes of this research only the total sum of the student's life events score will be used. In order to infer a casual relationship between stress and impairment, the college students were asked to indicate which events occurred in the past seven months and their <u>recent</u> anxiety and

depression.

For the past decade researchers have been focusing their energies on the articulation and conceptualization of stressful life events and psychological symptoms questioning, in part, why some people fall prey to psychological impairment while others do not. It is likely that it is the premorbid personality of the individual in combination with environmental variables that will predispose that person to the unfavorable outcome of stress. Specifically, the effects of the precipitating events interacting with the degree of genetic predisposition, emotional vulnerability, and psychological imprints of past experiences in a given individual might ultimately explain symptomatic responses.

The next section will look at the hardy personality style and its roots, specifically existentialism, and empirical research on some of the various components of hardiness. Also, the investigations of hardiness as a moderator variable and its implications for this research will be discussed.

Chapter 3

HARDY PERSONALITY TYPE

Characteristics of Hardiness

While most attention has been given to certain moderators of stress (e.g. social support) the recent investigations of individual personality factors, such as a hardy personality style (consisting of control, committment and challenge) warrant acknowledgement. Most stress researchers have viewed a person's reaction to stressful life events as passive acceptance and have encouraged the notion that life change should be avoided. This fatalistic account of behavior does not take into consideration the dynamic, action-oriented approach of those persons who stay healthy despite stressful situations. Taking an existentialist point of view, Kobasa (1979) investigated why some highly stressed executives did not follow the usual pattern of succumbing to physical illness. The existentialist position assumes that people should recognize their personal freedom to make vital choices and to assume responsibility for their lives. The ability to choose individual values and goals is intertwined with what, for that person, is meaningful in life. Existentialism encourages intrapsychic exploration of stressful events rather than a resigned acceptance of environmental factors. In other words, the individual's search for the significance of an event will be more meaningful than passively accepting its damaging consequences.

One cluster of traits – control, commitment, and challenge – encompassed in this existential philosophy, emerged as the "hardy personality". They appear to be the personality characteristics that enable an individual to cope successfully with stress.

Generally, control refers to the individual's belief that they determine the course and direction of their lives; that is, that their actions will influence the outcome of life events (Kobasa, 1979). A highly stressed but hardy person has the ability to confront a situation by making an accurate assessment of it and then decide on an appropriate course of action which would be congruent with the current life plan. A hardy individual perceives personal control over external factors, does not attribute an event to luck, fate or chance, and tries to find some purposeful meaning in the event occurrence. Taking the theoretical views of Averill (1973, see Kobasa, 1979) as her starting point, Kobasa defined the three dimensions which underlie the control characteristic:

(a) <u>decisional control vs. powerless</u> – the ability to be aware of and then select from the various solution alternatives available when confronting a stressful situation;

(b) <u>cognitive control vs. nihilistic</u> – the ability to take the inevitable stresses of life in stride. According to Kobasa (1979), this is accomplished when the person can "interpret, appraise and incorporate...stressful events into an ongoing life plan" (p.3);

(c) coping skill repertory – the number and variety of appropriate, potentially effective responses a person has when dealing with stressful events.

Seligman's (1975) work demonstrated the impact of controllability on the development of learned helplessness. For Seligman however, learned helplessness was treated as the outcome variable of a specific experimental manipulation in which control was unavailable (real or assumed) to the subject. Kobasa extended this notion by showing that perceived uncontrollability, irrespective of its origin, is involved in the disease process. Thus, uncontrollability is incorporated as an independent variable. Furthermore, Kobasa intimates that the hardy personality represents relatively stable dispositional traits while Seligman's learned helplessness, at least as it was researched, seems more specific to the immediately previous experience of the subject.[2]

People who have a strong sense of commitment to themselves in particular and to others in general, and who are actively involved in evaluating and responding to an event, will be less susceptible to the ill effects of stress (Kobasa, 1982b). Such persons feel that what they do is both relevant and meaningful to them and their purpose in life. Having

[2]It should be noted that Seligman (1975) has speculated on the similarity between learned helplessness and reactive depression in that both derive from perceived lack of control over eventual outcome.

this sense of commitment enables the hardy person to face an event and cope with it rather than give up and suffer whatever consequences, including illness.

While commitment to self and to work are fundamental to the hardy personality, equally important is the commitment to other people in one's social sphere. Antonovsky (1974) theorized that being involved with others acts as a generalized resistance resource which ameliorates the harmful effects of stress. When a person is passive and/or does not have the inner resources to adapt to a situation, alienation from self and others occurs. Those who are alienated from themselves do not recognize the worth of their own values, priorities and goals, or their usefulness for adaptation (Lazarus, Averill, and Opton, 1974). They essentially stop trying to cope with the stressful event, and are unable to mobilize any of the social resources around them for assistance.

The last characteristic of hardiness is challenge—the tendency to view life change as stimulating rather than debilitating. A hardy person views a stressful event as an opportunity for personal development and shows an interest in situations whose outcome is unknown. Because value is placed on new experiences, this individual will be more adept at responding to the unexpected and more successful in coping with the potential stressor. Fiske and Maddi (1961) have defined the need for variation as seeking experiences that are different, novel, or unexpected. The individual's pursuit of new and complex situations is

seen as a search for excitement in the face of the ordinary, mundane banalities of everyday existence. Thus, it seems that individuals low in hardiness are content to remain in an apathetic and boring, albeit secure condition. They consider life change threatening, rather than challenging, and may often find themselves in a state of anxiety. Smith, Johnson, and Sarason (1973) investigated the relationship between negative events and neurotic behavior as a function of sensation seeking. Subjects who scored low on sensation seeking manifested change avoidance, dislike of intense, varied and/or complex stimulation, and satisfaction with boredom. The significant relationship between negative events and neuroticism for low, but not high sensation seekers, seems analogus to findings on stress and subsequent illness in low, but not high, hardy individuals.

Locus of Control as a Moderator

One characteristic of hardiness, control, has been used as a moderator variable in investigations of stress and psychological impairment. The initial work on locus of control as a moderator variable of the negative effects of stress was conducted by Johnson and Sarason (1978). Based on Rotter's theory of generalized expectancies for internal (I) vs. external (E) control, Johnson and Sarason defined those persons with an external locus perceiving themselves as powerless and attribute the occurrence and/or the outcome of the event to luck, fate or chance. On the other hand, individuals with an internal

locus would manifest behaviors indicative of personal responsibility for the event and/or its outcome. Using Rotter's I-E scale, the investigators found a significant positive relationship between negative life change and depression and anxiety but only for those displaying an external locus of control.

Using the same measure, Sandler and Lakey (1982) investigated differences between internals and externals on the perceived control over the occurrence and consequences of negative life events, and social support (the ISSB). They found that psychological symptoms of anxiety and depression following negative events were moderated by social supports among internals but not externals. This is especially interesting since they also found that externals had a significantly greater number of supports. While other interpretations of this apparent anomoly are possible, the authors seem partial to differences in the types of support available: "...more support is not necessarily ... better support" (p.76).

Lefcourt, Martin, and Saleh (1984) hypothesized that persons whose locus of control was internal for achievement and affiliation, and whose need for affiliation and autonomy, were low and high, respectively, would be more protected from the effects of negative life change than would those who were characterized by the opposite pattern: external in achievement and affiliation, high in need for affiliation and low in need for autonomy. After conducting three studies, the

researchers found, as predicted, that the relationship between negative life change and subsequent mood disturbance was weakened among persons who were internal for affiliation and achievement, required less affiliation, and were more autonomous.

Current Research

In the original study describing the hardy personality, Kobasa (1979) presented empirical support for the prediction that high stress/low illness executives had a stronger sense of commitment to self, a more positive attitude toward change, and a greater belief in control over life than did executives who manifested high stress/high illness. Data were collected from middle and upper level executives in a large public utility subject pool (n=837) on stress and illness measures for the preceeding three years. Three months later, randomly selected executives from high stress/low illness and high stress/high illness groups completed personality measures, and answered questions concerning their perception of life stress. Using discriminant function analysis, Kobasa found that high stress/low illness executives reported more meaningfulness in their lives, a more internal locus of control, more personal control, a greater sense of commitment to self, a more vigorous approach to life events, and a greater sense of adventuresomeness.

These findings have been supported in subsequent investigations. Kobasa, Maddi, and Kahn (1982) looked at stressful life events, refined

measures of hardiness, and illness outcome in a five year prospective study on executives. With prior illness level controlled, results indicated that high hardiness was significantly related not only to lower illness under high stress conditions, but lower illness generally. Later research (Kobasa and Puccetti, 1983) investigated hardiness, stressful life events, social support (boss and family), social assets (valued 'goods' in society such as occupation and income), and illness outcome on 170 business executives in a three year retrospective study. The main effects showed a decrease in illness for hardier persons and an increase in illness for individuals who had a great amount of stressful life events. Boss support and high hardiness interacted with a large number of stressful events to decrease the likelihood of illness. Executives exposed to high stress, but who were low on hardiness and high in family support, developed the greatest number of illnesses. Kobasa offers the following explanation for these last findings. Work related events contributed more to the total stress scores than did other events. If social supports are to provide a buffer for stressful events however, then they should be appropriate for the event context, i.e. boss support for work place events. Executives low in hardiness feel alienated, powerless and threatened by stressful events and may not have the ability to use the problem-solving strategies associated with boss support, which are essential for dealing with work events. A warm, loving supportive family may encourage these ailing executives to

remain home and avoid the anxiety producing situations in the work environment.

Another study was conducted to see if the stress-resistant resource of hardiness was an important moderator variable in the stress-illness relationship of lawyers (Kobasa, 1982a). Kobasa investigated the effects of stress, personality, coping, social support and physical fitness on the outcome variables of illness (e.g. peptic ulcer and hypertension) and strains (e.g. headaches and trouble sleeping) for the previous year in 157 general practice lawyers. A significant correlation between stress and strain was found but none between stress and illness. These findings may be attributed to the stereotype of lawyers as thriving on stressful situations and their reluctance to admit to illnesses, such as hypertension, gallstones or peptic ulcer. The personality characteristics of control and commitment, however, did attentuate the association between stress and strain and thus supported the findings with the executive group. These findings have been extended by research examining the role of hardiness in conjunction with other possible stress moderators. One prospective study (Kobasa, Maddi, and Courington, 1981) found that a hardy personality decreased the effects of stressful events while constitutional predisposition (family medical history) increased vulnerability to illness. Another investigation found that both hardiness and exercise interacted with stressful life events to reduce illness

(Kobasa, Maddi, and Puccetti, 1982).

Ganellen and Blaney (1984) questioned whether the hardy personality and social support are related and, if so, whether these two factors are equally potent over the effects of stressful life events or whether one exerts a stronger influence. They found both the commitment and challenge characteristics of hardiness correlated with support; the control characteristic, however, did not. It was further demonstrated that the consequence of stress, which in this study was depression, was affected by the presence of commitment, challenge and social support. More specifically, high stress in the absence of social support, commitment and/or challenge resulted in increased depression. The presence of commitment, but not of social supports diminshed the depression inducing effects of stress. While these findings were somewhat different from Kobasa and Puccetti (1983), the measures used in the two studies are not comparable. For example, the social support measure constructed by Ganellen and Blaney consisted of 12 items. These items reportedly "assessed the subjects' perceptions of the frequency of and satisfaction with both intimate and casual social contacts" (p.158). While Kobasa and Puccetti designated the various types of support measured, Ganellen and Blaney did not indicate what types of social support (e.g. boss or family, emotional, financial, or instrumental, etc.) were measured. Also, since no item exemplars were included in the publication, it was impossible to determine the

degree of overlap, if any, with the criterion variable.

All of the previous work conducted by Kobasa (1979, 1982a) and Kobasa et al (1981, 1982a, 1982b, 1983) has investigated the role of hardiness in the lives of professional men in the 32–65 age range who are married and successful in their chosen careers. Would this personality type act as a moderator variable in the stress-illness relationship for different populations? Specifically, can the characteristics of control, commitment, and challenge be seen in a younger group; those who are emerging from adolescence into adulthood, and have not yet performed in the job market, who have only chosen a major field of study in college; but, through the course of their lives may have had sufficient experience to have developed the internal resources comprising hardiness. Johnson and Sarason, 1978 and Smith et al, 1973 have already shown that the control and challenge characteristics of hardiness act as effective buffers against the deleterious effects of stress. It therefore follows that the third characteristic, commitment, will also serve to moderate the effects of stress among college students in the same manner as it did for executives. Working on a course of studies in college and working on job projects both require a similar pattern of commitment to work. Like the executive, students who are hardy individuals will derive meaning in their school work and place a high value on their college goals.

Further exploration of the relevance of hardiness, with emphasis on

existential theory, to college students will be included in the next section on college students. Developmental literature will be reviewed with particular attention paid to psychosocial theories of adolescence and early adulthood. Also, the sex-role socialization process that takes place in establishing an identity for one's self will be discussed.

Chapter 4

COLLEGE STUDENTS

At Risk for Life Stress and Psychological Impairment

Despite different theoretical leanings, researchers (Bloom, 1975; Heath, 1968; Sanford, 1962; Katz, 1968) agree that the college years, and particularly the first and last, are characterized by turmoil, confusion, and uneasiness. Indeed, findings have indicated that college students are at high risk for psychological impairment (Bloom, 1975, Marx, Garrity and Bowers, 1975) because they are at a life stage which involves rapid and major social and psychological changes. Between the ages of 18-30—generally referred to as "early adulthood" (Erikson, 1963)—the individual undergoes a transformation period in which social transition takes place, values are re-examined, and a new identity emerges.

Initially, the entering student experiences a multitude of struggles, coincident with becoming an adult. One of the necessary adjustments is to the novelty of the situation. Despite the changes that have occurred over the past 15 years (e.g. students living at home, attending school with their friends, and taking a longer of period of time to complete college courses, i.e. five to seven years) college bound students are faced with the challenges of a very different set of institutional guidelines, a new environment, and varying academic

demands. This is also a time when social transition takes place and intimate relationships are explored(Bloom, 1975; Katz, 1968; Sanford, 1962). One of the major changes described(from the late 1950's to the early 1980's) is in the relationships of men and women in college and what has influenced their new roles. There is also an emphasis on the influence of peers and the student's relations with their parent(s) and today this holds true as it did twenty five years ago. Whether a student moves away from the family environment or stays in the parent(s) home during the college years, there is still ambivalence between the need for parental support and the drive for independence. Over their several years in college, students will continue learning how to function autonomously, struggle for a new identity and develop mature social skills and interpersonal relationships.

In their sophomore year, the stressors for students shift away from the turmoil of social transition to choosing a major area of specialization. Most students have selected a major by the second semester of the sophomore year. For women, the selection of a field of study presents many problems. Social pressure (from men and other women) still continues on women encouraging them to choose majors that focus on social life and marriage instead of intellectual and occupational achievement. Thus, women experience role confusion but there is encouragement from other students to select a major that facilitates their goal, regardless of traditional expectations.

At the same time they are finding satisfaction in their studies, juniors more closely scrutinize their own, as well as their parents', values and beliefs (Heath, 1968). From this examination emerges their own sense of what values and beliefs are important. They begin to expand their new identity which is quite differentiated, and perhaps more complicated, than the identity they came in with as a first year student. Various opportunities have presented themselves for increased self-development over the years.

The senior year brings on pressures anew (Katz, 1968). The time has come for the student to leave the shelter of the college and enter the work force. Amidst the preparation for these new ventures, the academic and social necessities of college life still continue. Consequently, the graduating senior, pressured by concomittant demands, may experience anxiety, bewilderment, and apprehension. Some of this anxiety is related to the student's concern that the new identity developed over the past four years is not appropriate for life after college. Thus, the student may be preoccupied with his/her future identity and role.

Despite all that has been written about college students, few studies have examined the stressful life events of students and any psychological impairment that may result from these stressful situations. The most salient ones are included here. Bloom (1971) stated that first year students are the most vulnerable to stressors in

their initial months of college. He cites studies which indicate that a large percentage of first year students experience anxiety, depression, insomnia and irritability. These high-risk students seek out help with their problems more than other college students. Bloom (1971) described a preventive intervention mental health program for first year students. He found that among those who participated, significantly more remained after the first year than a comparison group who did not participate in the program.

Marx, Garrity, and Bowers (1975) investigated stressful life events and illness in 314 entering students. They found that as life change means increased so did illness outcomes such as number of health problems, number of health problem episodes, number of days ill, and psychological impairment. There was a significant difference between males and females on the mean number of days ill across high, medium, and low life change categories with females reporting the greatest number of illness days. No significant differences were found on any other demographic variables. Using the same variables from the 314 students above, Garrity, Somes and Marx (1977) investigated three personality dimensions; social conformity, liberal intellectualism, and emotional sensitivity, from the Omnibus Personality Inventory (available on 250 of these students) as additional variables. They proposed that these personality characteristics would act as resistance factors and affect the negative health outcome following life changes.

In regression analyses they found these dimensions to be significant predictors of health changes in such a way that a student low on social conformity yet high on intellectual flexibility, tolerance for ambiguity, emotional sensitivity, and a willingness to admit to adjustment problems is at greater risk for illness. These combined variables account for only 5% of the variance while the total life change scores account for 12.9%. The authors are unable to explain these findings.

While the above studies focused on the first year student, others have focused on college students in general as well as locus of control as an outcome variable. Crandall and Lehman (1977) and Gilbert (1976) found that as life changes among college students increase so do their symptoms of maladjustment. And as life changes increase so does the feeling of being under the control of others rather than under self-control. None of these studies have examined a personality style which may act as a buffer against stressful life situations and decrease the negative psychological effects.

Certainly from the above it is clear that this particular time during the life span has stressful life events or stressors that are unique to college students. There are two common themes that occur throughout the literature; one is the student's struggle for a new identity and the second is the changes in the relationships between men and women.

To address the first theme of identity requires us to look at the level of student development. Erikson's (1963) stage five, identity vs.

role confusion, has been used to describe the psychosocial development of adolescence, not the early adulthood period. However, since this work was written and explored there have been many changes in the development of both adolescents and adults. The most striking one is the advance of the women's movement which has spurred women on to pursue careers not previously considered to be within their grasp. Since the inception of the women's movement, coincident with the sexual revolution of the 1970's, both men and women are now getting married later in life—not at 20 years old but at 30 and 40 years old—and are having fewer children. Since these marriage and parental roles are postponed, there needs to be a shift up the developmental scale. One can argue that stage five, identity vs. role confusion, is really the stage of early adulthood, not adolescence. Katz (in Bloom, 1975) has referred to college students as entering "the second phase of adolescence", so perhaps stage five covers what has traditionally been called adolescence as well as early adulthood. Stage six, intimacy vs. isolation (generally considered the stage of early adulthood), refers to a period whereby an individual has emerged from the search for identity and is willing to select a partner. While this may have been true in 1963, it does not apply to the college population of today. In other words, the college student is seeking a new identity at this point in time and is not quite ready or willing to make a committment to a marital union. If one views the college student in a stage of identity vs. role

confusion, then a discussion of sex-role identity is most appropriate.

The second theme throughout the current literature refers to the relationships between men and women. This has been addressed somewhat in the paragraph above in terms of the developmental changes. Of equal importance is the shift in the areas that women choose to specialize. Twenty five years ago (Sanford, 1962) women were more interested in a general education and the resultant social life and marriage. Today, women's roles in work, society, and educational areas are indeed quite different. In fact, women are postponing marriage and children (and fewer children) in order to pursue various work roles and careers. Women previously concentrated on certain majors—humanities, certain health fields, and education— and men focused their energies into business, physical sciences and engineering. Despite the fact that fields of study are not as segregated as before, women and men still tend to concentrate in different areas. This issue will be addressed in more detail later in the discussion of sex-role socialization and gender differences; but one should realize that the selection of a major is an important source of stress for college students.

What is implicit in the literature on college students, although not concretely investigated, is that some students handle the multitude of changes differently from other students. Some students view stressful situations as exciting challenges rather than terrible problems. It

seems that the choice of a coping strategy varies according to the environmental resources (e.g.peer and college support) and more importantly, the individual resources (e.g. personality characteristics) of the student. What emerges from the literature review is that first and fourth year students , becasue of their entrance into and departure from college, tend to be more depressed and anxious and the inclusion of their data may confound the outcome variable of psychological impairment, as defined by anxiety and depression. Therefore, in this study, only the data from sophomores and juniors, as defined by the number of credits completed (31-90), will be used. If we are going to investigate personality style as a coping strategy for stressful life events in college sophomores and juniors, the field of study a student selects is an important variable. Let us first review the theoretical and empirical work on why students choose their major, the relationship between major and psychological impairment and the relationship between major and personality before discussing the sex-role socialization and gender differences in major field of study.

Academic Field of Specialization (Major)

Several factors that contribute to the student's selection of a major field of study during college have been advanced. According to Cebula and Lopes (1982) monetary variables, whether they be associated with a particular future job or the cost of major field of study (e.g. necessary postgraduate training), are of the utmost

importance. Another extrinsic factor is prestige and the future job status of a particular major. On the intrinsic side, "task difficulty" plays a role, as well as perceived teaching quality, perceptions of friendliness of both teachers and students, and competitiveness of students.

Little has been done to investigate how major effects psychological impairment. Bereiter and Freedman (1962) reviewed earlier work which described the humanities (e.g. literary, fine arts) and social science majors, who are in disciplines focusing on human relationships, as being more aware of psychological problems. Natural science and applied science (e.g. engineering, business) majors, whose studies generally involve inanimate objects, were viewed as being less aware of psychological problems. Ellis (1968) reported on 493 students who sought help at the college psychiatric clinic. Contrary to expectation, social science majors did not use services in greater proportion to their representation in the population. Bereiter and Freedman (1962) raised the question of whether social scientists or natural scientists have more psychological impairment. In a review of previous work, they reported that the humanities/social science majors were the most troubled or neurotic with the "most worries, conflicts, and fears" (p. 571). One would expect social science/humanities majors, who are reportedly more aware of and more sensitive to relationships of an interpersonal nature, to show comparatively more evidence of more

symptomatology. The above findings regarding psychological impairment were based on proportions and percentages rendering the reliability and validity of the data questionable. Since that time, more sophisticated methodological techniques have become available thus, a reinvestigation seems justified.

Some researchers (Tatzel, 1980; Bereiter and Freedman, 1962; Witkin et al, 1977) have looked at personality factors, such as the cognitive style field dependence-independence, and their effect on program selection. The question of early childhood history and its effect on major choice is a provocative issue. Bereiter and Freedman (1962) report an investigation which described the social scientists' family relationships as disturbed during childhood perhaps accounting for their current interest in interpersonal situations. The natural scientists, however, having experienced unemotional, detached relationships in childhood are more comfortable in impersonal circumstances.

Tatzel (1980) found that the personality trait of tolerance for ambiguity was significantly higher among art students than business students. She suggests that art students possess cognitive flexibility, openness to new ideas, and creativity which are related to a tolerance for ambiguity. Interestingly, pursuit of complex situations, seeking varied experiences, and having an ability to adapt to situations are similar to the attributes of art students and are part of the challenge

characteristic found in a hardy personality.

Witkin, Moore, Oltman, Goodenough, Friedman, Owen, and Raskin (1977) conducted a longitudinal study on college students which examined the relationship between cognitive style (field dependence-independence) and choice of and success in major. Their findings supported those of Bereiter and Freedman (1962) regarding the social orientation of various majors. Compared to field independents, field dependents were more attentive to social cues, more interested in others, more involved in personal relationships, and generally they were easier to get along with and more self disclosing to others as others are to them. Field independents were insensitive to social cues, prefered more solitary impersonal situations and were more concerned with ideas and abstract principles. Of greater importance was the finding that one's position on the field independence-dependence dimension was found to be predictive of college major. The education courses attracted the field dependents while the natural sciences and mathematics were preferred by the field independents. Of particular interest here is that education and humanities majors are primarily dominated by women while the science and mathematic majors are comprised of mostly men. It appears, then, that in order to succeed in a particular discipline, students either initially select, or change to a field of study whose demands are compatible with their cognitive style.

While the preceeding studies have investigated certain differences

in college majors, they have not sought to determine whether field of study, stressful life events and personality characteristics affect psychological impairment. If the social science/humanities majors report more psychological impairment, they may also report more stressful life events. Reporting a life event, however, can be measured more concretely than symptomatology and so stressful life events is not expected to be significantly different between the two disciplines (social science/humanities and science/mathematics). While one's personality traits can be expected to influence many types of situations a student encounters, and therefore the kinds of stressors she/he must cope with, it is hypothesized that the personality constellation of hardiness will moderate the effect of these stressors, irrespective of their nature. As personality traits influence the focus of one's interest, hardiness determines the dedication and "stick-to-it-ive-ness" with which these interests are pursued.

In the above section on academic field of specialization, selection of a major was explored in the context of life stage development and stressful situations throughout the college years. Also investigated were the interaction of a particular major and psychological impairment as well as major and personality. What needs to be discussed at this point is the sex-role socialization process for both men and women as an important determinant of choosing a field of study and the gender differences on different psychological (and sometimes physiological)

variables.

Sex-Role Socialization and Gender Differences

Traditionally, certain specializations were female dominated, e.g. elementary education, and selected for their human service value and interpersonal skills. Conversely, other majors, such as business, were male dominated and chosen for future job status and remunerative potential (Strange and Rea, 1983). As mentioned earlier, Cebula and Lopes (1982) view money, prestige, and status as the reasons why a student enters a particular field of study. Certainly this is true for men, who are socialized to achieve success in their careers with resultant financial rewards, recognition, and a personal sense of achievement. The male dominated majors—science, business and technology—lead to the better paying, higher status jobs. Women specialize in areas such as education, nursing, and the humanities which result in the poorer paying, lower status jobs. Although women are graduating from college and seeking entry into traditionally male, high-prestige occupations at a higher rate today, they are still not choosing and pursuing careers in high-level professions to the same degree as their male counterparts (National Center for Education Statistics, 1981).

Now pervasive throughout the literature is the concept of masculine and feminine traits or characteristics (Williams, 1983). For women the characteristics revolve around warmth, nurturance,

caring, dependence, and emotional expressiveness, while for men they involve competitiveness, powerfulness, aggressiveness, independence, and dominance. And today college men and women still feel pressure to conform to these sex-role stereotypes learned at an earlier age. It is in the expression of these characteristics that a typical major for women is education or nursing while for men a typical major is business or engineering. In investigating sex-role concepts, Rea and Strange (1983) found that women in cross-gender majors reported masculine self concepts and difficulty in proving themselves in the field. These differences were not paralleled for men. The investigators suggested that men who enter female dominated areas are interacting with faculty and students who are skilled in initiating and maintaining interpersonal relationships and therefore, are more responsive to the male student's needs. If men who are in atypical majors are indeed hardier, perhaps it is because this personality style has been encouraged and fostered by the faculty and students.

Martin and Light (1984) used the Bem Sex-Role Inventory and found that more students majoring in either business, math, engineering, or agriculture scored in the masculine group, while students majoring in the behavioral sciences or home economics tended towards femininity. Along these lines, Bereiter and Freedman (1962) reported that humanities/social sciences are considered feminine while the natural sciences/applied sciences are evaluated as masculine. Greenfield,

Holloway and Remus (1982) investigated differences between men and women engineering students on a number of variables. Women engineering students saw the opportunity to help others as a primary career satisfaction and were more interested in aspects of engineering that were people oriented than were male engineering students. Rotter (1982) examined the traits assigned to engineering and liberal arts students. While the work related traits were similar for men and women in engineering, women in engineering were rated as less attractive, less likeable, and less interested in dating than were their liberal arts peers. From the above data it might be anticipated that men who major in the social science/humanities would not conform to the expected pattern of male related traits and/or behaviors.

Frankenhauser (1978) initially found gender differences in adrenaline excretion during three stressful tasks (IQ test, color-word conflict task, and venipuncture). While both males and females performed equivalent on the tasks (and females slightly more superior on the color-word task), males showed significantly greater adrenal activation. Frankenhauser et al (1978) results are consistent with the previous work indicating that physiological costs are high for males and the psychological costs are high for females in stressful achievement situations. They used male and female high school students and investigated catecholamine secretions during a challening and important examination on which their acceptance into university would be based.

While males and females performed equally well on this examination, males had significantly more catecholamine excretion. On the psychological side, however, females reported greater feelings of discomfort and failure while males reported a greater sense of satisfaction and success. Interestingly, females who reported high discomfort performed better on the examination than did females who reported lower discomfort while the reverse was true for males.

In a longitudinal study, using many of the same subjects in the study described above, Rauste-von Wright, von Wright, and Frankenhauser (1981) looked at adrenaline excretion during a 6-hour long examination and compared these results with adrenaline excretion during 2-3 hours of regular school work. Their findings indicated that there were low correlations between adrenaline secretion in the control condition but not so for the stress condition and there were gender differences. For males there was a positive correlation between adrenaline excretion and achievement orientation and a negative correlation between adrenaline excretion and both psychosomatic concerns and anxiety while the correlations for females between these variables were close to zero. These investigators also looked at the students' plan to enter university and found that all but one male intended to continue their education while several of the female students intended to pursue a traditional feminine role of housewife and mother. Perhaps these females who are not achievement oriented had

less of an investment in doing well during the examination and therefore excreted less adrenaline. Indeed for females there was a negative correlation between adrenaline excretion and their sense of self-esteem and sense of fulfilling social expectations. The investigators suggested that males coping strategies are achievement oriented while females physiological and psychological responses are more varied during stressful situations. They also suggested that females adrenaline excretion will increase in achievement situations "when they are personally involved in achieving well" and "when the external (social) demands relating to the situation are experienced as high in relation to the experienced capacity to cope with the situation" (p.370). From this it would be anticipated that females who choose atypical majors for their gender would have the same physiological and psychological responses as males during stressful situations.

In a further investigation Frankenhauser(1978) predicted that females in a gender atypical major, i.e. engineering, would show similar male sex-role patterns in physiological and psychological responses. She found that adrenaline excretion levels were the same for both male and female engineering students on a stress-induced task, thus distinguishing these females from those in previous experiments. Both males and females rated themselves high on both male and female traits thus classifying them as androgynous.

In a follow-up study, Collins (1985) investigated whether the

excretion of adrenaline during a stress condition was related to intellectual ability and/or childhood and interests as well as masculine and feminine self-ratings. She found that in the stress condition males excreted significantly more adrenaline than females while there were no significant sex differences in the control condition. Although childhood interests conformed to the typical sex-role patterns, adult interests were more andrgynous for both men and women with women showing the greater cross-sex interests. Both groups rated themselves high on masculine and feminine characteristics, however,there was a significant positive correlation for females between adrenaline excretion in the stress condition and masculine interest scores and a significant negative correlation between adrenaline excretion and feminine interest scores. In the male group, the reverse correlational pattern was found. On intellectual ability, males scored significantly higher on spatial ability and females on perceptual speed. Males had a significant positive correlation between spatial ability and adrenaline excretion. For femlaes the correlations for all intellectual abilities were negative or close to zero from baseline.

Collins(1985) cites other studies that have found similar results and suggests that males are more achievement oriented in our society; but one finds this difficult to believe since all the subjects (male and female) were in a major field of study that required similar diligence

and ability. In fact , both males and females performed equally well on the tasks, regardless of whether they were in the stress or control conditions. Collins, using information from other work done by Frankenhauser, also suggests that girls use social cues learned at an earlier age and may indeed respond to the stress situation differently by decreasing their physiological responses. Similar to the findings of Frankenhauser (1978) and others, Collins suggests that males and females who have different sex-role orientations from the traditional roles show various physiological responses to a stress induced task. Frankenhauser(1978) suggests that new coping mechanisms, involving the traditionally female emphasis on interpersonal relationships, will be explored by men and possibly reduce the risk of disease. This suggests that students majoring in gender atypical majors may be subject to additional pressures beyond those inherent in higher education. This added stress may result in greater impairment and/or academic failure.

Chapter 5

METHODOLOGY

Research Plan

The purpose of this investigation was to examine the relationship between stressful life events, hardiness, and field of academic specialization, with particular attention to gender atypical majors, and subsequent psychological impairment.

Since 1967, the stress literature indicated low but positive correlations between stressful life events and psychological impairment. A similar significant correlation was expected to also be found in this study. Investigating the psychological impairment differences between major field of study had not been done in 15 years. Given the nature of the majors, consistency with the data of Bereiter and Freedman (1962) was anticipated even though the college experience and values associated with that experience have changed. That is, the social science/humanities majors were predicted to report greater psychological impairment than would the science/mathematics majors.

Although the research on the hardy personality type has uniformly demonstrated that a person high on hardiness has less psychological and physical impairment, these effects had only been observed in successful, male executives and lawyers in their 40's. It was not clear if this was so for college age men and women who had chosen a major,

but not necessarily a career. As stated earlier, it was possible that some students would have already developed this personal resource of hardiness. And as hardiness is more of a process oriented trait, affording the student cognitive appraisal of a situation, followed by selection, planning, implementation and evaluation of coping strategies in highly stressful events, irrespective of what that event may be, it was not expected that either of the two broadly defined college major areas (social science/humanities versus science/mathematics) would score significantly higher on the hardiness dimension. However, students who are high in hardiness will report less psychological impairment than students who are low in hardiness.

Assuming that some college students would show greater evidence of hardiness, the question that remained was whether it functions as a moderator variable under high stress conditions. This investigation attempted to extend the findings of Kobasa (1979) to a different population, one that is younger and not predominantly male. Based on these previous findings, one expected that under high stress conditions, college students who report greater hardiness would show evidence of less psychological impairment.

What about the differences that have been described in the literature between men and women in major field of study? Despite the momentum that the womens movement has gained from the late 1960's to the present, sex-role stereotypes are still prevalent in our society.

Recent literature has provided evidence (Greenfield et al, 1982; Strange and Rea, 1983; Martin and Light, 1984) that the social science/humanities and science/mathematics majors are as much regarded as feminine and masculine, respectively, today, as they were in 1962 (Bereiter and Freedman, 1962). Also reported was that men and women who major in areas nontraditional or atypical for their gender demonstrated sex-role behaviors contrary to the typically learned sex-role pattern. One expected that women and men who chose atypical majors in college (e.g. women in engineering and men in nursing) had role models earlier on who fostered and encouraged these current sex-role concepts. While most research has reported only psychological findings for this, Frankenhauser (1978) and Collins (1985) provide us with both physiological and psychological support. With the added stress of functioning in gender atypical disciplines, one might expect that college students who succeed in nontraditional majors would show evidence of a greater sense of commitment to themselves and their studies, more control over the direction of their lives, and would more diligently pursue various situations significantly more than would students who choose traditional fields. In other words, hardiness should be greater for those in majors atypical for their gender. The model of the stress- impairment relationship (Figure 1) indicates that usually students choose majors traditionally dominated by their gender. Some men and women, however, choose atypical majors and these hardy

individuals will suffer less subsequent impairment than their more traditional counterparts.

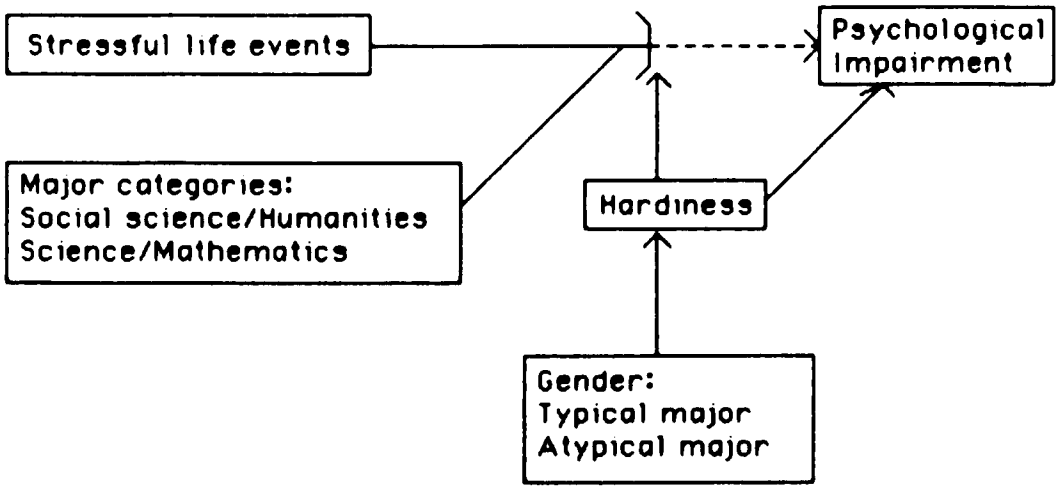

Figure 1. Model of stress-impairment relationship for gender typical and gender atypical majors among college students

Hypotheses

1. The more stressful life events college sophomores and juniors experience, the greater the evidence of psychological impairment.

2. Among those sophomores and juniors who experience stress, the social science/humanities majors will show evidence of greater psychological impairment than those who are science/mathematics majors.

3. College sophomores and juniors who score high on hardiness will be less psychologically impaired than those low on hardiness.

4. College sophomores and juniors who are under high stress and are high in hardiness will report significantly less psychological impairment than those students who are under high stress but are low on hardiness.

5. College sophomores and juniors who major in areas atypical for their gender will show evidence of more hardiness and less psychological impairment than those students who are in majors stereotypical for their gender.

(a) Women sophomores and juniors who major in science/mathematics will be higher on hardiness and report less psychological impairment than women who major in social science/humanities areas.

(b) Men sophomores and juniors who major in social science/humanities will be higher on hardiness and report less

psychological impairment than men who major in science/mathematics areas.

Overview of Procedure

Four hundred and eighty five students from four metropolitan colleges (Brooklyn College, Hunter College, New York University, and Queensborough Community College) participated in this research project by completing a questionnaire (see Appendix A). These students were recruited for this study in one of two ways. The students at New York University, Queensborough Community College, and Hunter College were approached at the beginning of a class period while the students at Brooklyn College were obtained from a subject pool and signed up for a 45 minute study on "stress and personal views". The questionnaire measured demographic characteristics, anxiety and depression symptoms, stressful life events, hardy personality type, and social support systems. There were no differences on either the dependent or independent variables between the students at any of these colleges.

Subjects

The 163 students selected for inclusion in the sample attend college on a full time basis and are between 18 and 30 years of age. The rationale for inclusion was that most students begin college at 17 or 18 and take anywhere from four to seven years to graduate. Because each stage of the life cycle has its own stressors only those students in

the 18-30 year range (M age = 20) were included. Those over the age of 30 (n=34) were excluded. These students were undergraduates attending classes in introductory psychology, human development, statistics, business, and experimental psychology. Although data were collected on all the students in the classroom at the time of testing, only the data from those students in the second and third years of college (sophomores and juniors—between 31 and 90 credits) was examined (see pg. 38). This last criterion omitted first year students (n=174) and fourth year students (n=42). Since selection of a major was important to the concept of this research, those students who were undecided about a major (n=18), or selected double majors in both humanities/social sciences and mathematics/science (n=4) were excluded.

The final sample, composed of 59 males and 104 females, was composed of the following racial backgrounds: white-46%; black-32%; hispanic-8%; and other-14%. The majority of the students were single (98%), with 72% living with a parent(s), 15% with a roommate, 6% with a relative, 6% alone, and 1% were married (n=2) and living with a spouse. In addition to attending college full time 12% of the sample worked full time, 58% worked part time, 11% worked occasionally and 19% did not work at all. The median income of the sample was in the $16,000 to $20,999 range.

Subjects indicated their major field of study which was then placed

in one of two broad categories: humanities/social sciences or mathematics/science, as dictated by ratings of an independent group of 20 judges. These judges, enlisted by this researcher, had either completed college, were in graduate school, completed graduate school, or worked in an academic setting and were familiar with college majors. They were given a list of 50 majors (see Appendix B) that a college student could choose from and asked to assign each of the areas into one of the two categories. A major was included in a category if there was 80% aggreement among the judges. For only one major, Insurance, was there less than 80% agreement; however, since none of the college students studied selected this major, it did not present a problem. Appendix B lists the majors as well as their classification.

Measures

Demographic Characteristics. The first page of the questionnaire ascertained gender, age, marital status, race, living situation, income, college status, work situation, major field of study and number of college credits.

Measures of psychological impairment. The Profile of Mood States (POMS) (McNair, Lorr, and Droppleman, 1971) was used to determine the present mood state of the subjects. The POMS is a checklist of 65 items (of which seven are fillers) by which the subject reports how she/he has been feeling during the past week on a five point scale ranging from not at all (0) to extremely (4). Six separate scales

have been derived through factor analysis: 1) tension-anxiety (9 items); 2) depression-dejection (15 items); 3) anger-hostility (12 items); 4) vigor-activity (8 items); 5) fatigue-inertia (7 items); and 6) confusion-bewilderment (7 items). Only the first two scales were used as measures of psychological impairment in this study since psychological impairment was previously defined as anxiety and depression (see pg. 29). The POMS for which norms have been established for college students has high internal consistency, test-retest reliability, concurrent validity, and construct validity, and with the exception of the anger scale, does not appear to be contaminated by social desirability factors.

The trait form of the State-Trait Anxiety Inventory (STAI) (Spielberger, Gorsuch, and Lushene, 1970) was used to establish the general anxiety level of each subject. This self-report questionnaire consists of 20 statements each of which asks the subject to report how she/he generally feels on a four point scale ranging from not at all (1) to very much so (4). Both the test- retest reliability (.73 to .86) and internal consistency were found to be high. Concurrent and construct validity have been established as well as the norms for a college age population.

The Beck Depression Inventory (BDI) (Beck, 1967) was administered in order to determine the amount of depression experienced by the subjects. This inventory is composed of 21

categories of attitudes and symptoms. Each of these categories represents a specific behavioral manifestation of depression. The subject is instructed to select one of the four or five self- evaluative statements from each category which best describes how the subject is feeling right now. Internal consistency was found to be high (.86 to .93) and both concurrent and construct validity have been demonstrated.

Measure of stressful life events. The 73 life events used were from the Sarason, Johnson, and Siegel (1978) Life Experiences Survey which includes items specific for a college population. Some items inappropriate for the present age range and sample were deleted, such as foreclosure on a mortgage or loan, retirement, finished school, and son or daughter leaving home. While other items were subdivided, e.g. "changing a major" became "changed to an easier major" and changed to a harder major", they were not individually examined for the purposes of this study. Also, in this study, stressful life events were defined as those requiring change or readjustment for the average person and thus, two additional events, which may be viewed as positive, were added: "made new friends" and "vacation of at least one week". Items relating to crime victims (Bard, 1980) such as "assaulted and/or robbed" and "apartment or house burglarized" were added. The list of events were grouped according to activity areas such as school, work, love and marriage, children, family, living

environment, legal, financial, social life and recreation, and health. While the significance of life events is not expanded by a priori categorization (Tausig, 1982), this clustering makes it easier for the subject to read and understand. Subjects checked off each of 73 events that happened to them in the past seven months (since September 1984). The stressful life events measure can be considered normative because the stressful ratings from an independent group of 50 judges (see stressful life events weights in the next section) were used. This follows from the belief of some investigators (Dohrenwend et al., 1978) who suggest that normative ratings or consensus weights can be used in stressful life events measure to ensure that the findings are not confounded with individual predispositions and subjective experiences.

Stressful life events weights. An independent group of 50 judges, from an introductory psychology class as Hunter College, filled out a social readjustment questionnaire which was used to assign weights to the stressful life events. The social readjustment questionnaire (see Appendix C) asked the judges to assign a value, with 500 as an anchor point for marriage, to each of 72 life events. These judges were asked to rate each event based on the amount of social readjustment (both intensity and length of time) necessary, regardless of desirability of the event. The directions for assigning values were the original ones used by Holmes and Rahe (1967). From this the mean of the objective judges' values for each event was divided by 10 to arrive

at a weight of stressfulness for each of 72 events (marriage already having a weight of 50). The mean for each stressful life event can be found in Appendix D.

Measure of hardiness. The 47 items for this measure are titled, "Personal Views". These items were derived from six scales: 1) alienation from work scale, 2) alienation from self scale, 3) powerlessness scale, 4) external locus of control scale (Rotter, Seeman, and Liverant, 1962), 5) security scale of the California Life Goals Evaluation Schedules (Hahn, 1966), and 6) the cognitive structure scale of the Personality Research Form (Jackson, 1974). The first three scales are from the alienation test of Maddi, Kobasa, and Hoover (1979). These scales represent the personality style of hardiness which is characterized by control, commitment and challenge. For the external locus of control scale, subjects indicated which statement from each of 11 pairs best respresented their attitude. For the other scales, subjects indicated on a four point scale (0= Strongly Disagree, 1= Mildly Disagree, 2= Mildly Agree, 3= Strongly Agree) their reaction to an item. Each of these scales separately has an adequate reliability and validity. When used together as a measure of hardiness, internal consistencies have been in the .80's and the stability correlation over a five year period was .61.

Measure of Social Supports. The results of this measure will be used in another study.

Procedure. Whether the students were recruited from the subject pool or in the classroom setting, the following instructions were given to all the students by this researcher:

> Today you are being asked to participate in a research project which involves answering questions about your life experiences, feelings, personal views, social supports and attitudes. We are interested in experiences which may or may not have been difficult for you and the ways other people may have helped you, and how these experiences are related to your current feelings, attitudes and personal views. With your cooperation in this study we can gain knowledge about the interrelationship of these variables and their effects on college students.
> It will take approximately 45 minutes to fill out the questionnaire. Please do not dwell on any particular item relating to your feelings, attitudes or personal views for too long; it is better to write down your initial response. Also, this is not a test and there are no right or wrong answers; we are interested in your personal opinions. Please do not put your name on the questionnaire so that no one will be able to identity who you are and your answers will remain anonymous. You are free to withdraw from this study at any time, even if you have partially filled out the questionnaire.
> If you are interested in obtaining a two page summary of the results of this study, please put your name and address, including zip code, on one of the stickers that will be passed out.
> Thank you for your cooperation in this study.

The questionnaires were then given out to the students. Each questionnaire was identical in the sequence of the demographics and measures (see Appendix A) for each student. For reader clarity, the measures are labeled by their test title, in parentheses, in Appendix A. When the questionnaire was completed, it was collected by this researcher and each student was again thanked for their participation.

Chapter 6

RESULTS

Characteristics of Stressful Life Events and Psychological Impairment

For the final sample of 163 sophomores and juniors, the mean stressful life events score was 398, with a median of 381, a standard deviation of 199, and a range from 25 to 1207. The stressful life events measure was adapted from Sarason, Johnson and Siegel (1978); however, they looked at the number of positive, negative, and total events for subjects and did not use weights obtained from another sample. Therefore, there are no means for the stressful life events measure reported by Sarason, Johnson, and Siegel (1978). According to Holmes and Masuda (1974), a mean stress score of over 300 is indicative of major life crises and increases the association with health changes to 79%.

For each of the outcome measures, there were 162 of the 163 subjects, since one subject did not complete the POMS anxiety and depression and another subject did not complete the STAI trait form of anxiety nor the BDI. For the POMS anxiety scale the mean was 12.82, with a standard deviation of 7.70, and a range from 0 to 31. For the POMS depression scale the mean was 11.70, with a standard deviation of 10.83, and a range from 0 to 45. The mean for the STAI trait form was

42.03, with a standard deviation of 10.13, and a range from 22 to 67. The final dependent variable, the BDI, had a mean of 7.46, with a standard deviation of 6.52, and a range from 0 to 31. When comparing these mean scores with other findings for college students (Sandler and Lakey, 1982; Monroe, Imhoff, Wise, and Harris, 1983; Hammen and Mayol, 1982; Bumberrry, Oliver, and McClure, 1978), they are slightly higher but within normal limits (within one half standard deviation).

Characteristics of Academic Area of Specialization(Major)

For the 163 students, 90 were in the social science/humanities major and 73 were in the science/mathematics major. To further subdivide major by gender, there were 62 women and 28 men in the social science/humanities major and 42 women and 31 men in science/mathematics. The most frequently chosen disciplines were: 1) Nursing (22students of which 3 were male; 2) Psychology (17 students of which six were male); 3) Accounting/Finance (17 students of which 4 were male); 4) Computer Technology (14 students of which seven were male); and 5) Business/Marketing (11 students of which five were male). In line with traditional roles, all five students majoring in secretarial science were female and all six students majoring in engineering were male. The two interesting findings are that all five pre-med students were female and the seven English/History majors were male.

Characteristics of Hardiness

Table 1 shows the intercorrelations for the six separate scales used to measure hardiness. These intercorrelations were performed to test for dissimilarities or differences between the hardiness scales. It should be noted that, with the exception of the cognitive structure scale, all of the correlations are significant and positive, as would be expected. The correlation between the two challenge scales, the security scale and the cognitive structure scale, was .04 ($p > .31$), indicating that there was very little relationship between those two scales. In fact, the cognitive structure scale had a significant correlation with only the powerlessness scale. Coefficient alpha was computed in order to determine the reliability or generalizability for five of the six scales (external locus of control omitted because it was a two point scale whereas the other five were four point scales) and the value was .65. In addition, item total correlations were computed and all were reasonably high (above .33) except for the cognitive structure scale which was .09. With the cognitive structure scale deleted, the coefficient alpha increased to .74. As a result, the cognitive structure scale was dropped in further analyses and the security scale score was doubled as it was the only scale representing the challenge component of hardiness. The composite hardiness score was then obtained by calculating z scores for each scale and summing across them. This was the same procedure used by Kobasa et al (1982a) when deletion of

Table 1

Intercorrelations of six hardiness scales

Scale	1	2	3	4	5	6
1. Alienation from work	1.00	.62***	.27***	.03	.51***	.33***
2. Alienation from self		1.00	.25**	-.06	.44***	.33***
3. Security			1.00	.04	.34***	.17*
4. Cognitive structure				1.00	.28***	.09
5. Powerlessness					1.00	.36***
6. External locus of control						1.00

* $p < .05$
** $p < .01$
*** $p < .001$

the cognitive structure scale was necessary. Usually the more negative the score the hardier the person, however, for this study the signs have been reversed and the more positive the score, the hardier the person. For this hardiness composite score, the mean was .000, with a median of -.328, a standard deviation of 4.16, and a range from 8.37 to -9.65.

Test of Prior Assumptions

Initially, *t*-tests were performed on (1) hardiness by majors and (2) stressful life events by majors to test the assumptions that hardiness does not influence major and that there is no relationship between stressful life events and major.[3] There were no significant differences between the groups in either of these *t*-tests. Additionally, a *t*-test was performed on stressful life events by gender to insure that subjects of one gender did not experience more stressful life events than those of the other. This test revealed no significant differences between males and females on stressful life events.

Correlations of Independent and Dependent Variables

Table 2 shows the intercorrelations between stressful life events, hardiness, gender, age, income, major and the four outcome variables

[3]In this sentence, major refers to social science/humanities or science/mathematics and not gender typical or atypical majors.

Table 2

Intercorrelations of stressful life events, hardiness, demographics, and outcome measures

Measure	1	2	3	4	5	6	7	8	9	10
1. Stressful life events	1.00	.01	.55	.03	-.16*	-.08	.21**	.18*	.17*	.17*
2. Hardiness		1.00	.08	.09	.17*	.02	-.32***	-.29***	-.43***	-.29***
3. Gender			1.00	-.06	.005	-.12	.05	.18**	.23**	.22**
4. Age				1.00	-.24***	-.16*	.07	.10	.05	.03
5. Income					1.00	.05	-.13	-.19**	-.13*	-.21**
6. Major						1.00	-.10	-.10	-.04	-.06
7. POMS Anxiety							1.00	.73***	.66***	.50***
8. POMS Depression								1.00	.70***	.68***
9. STAI Anxiety									1.00	.72***
10. Beck Depression										1.00

* $p < .05$
** $p < .01$
*** $p < .001$

of POMS anxiety and depression, STAI trait anxiety, and the Beck Depression Inventory (BDI). For major, the social science/humanities majors were designated with a one and the science/mathematics majors were given a value of two. For gender, males were designated as one and the females were given a value of two. The correlations between stressful life events and the four outcome measures are all significant (.17 to .21) and similar to correlation coefficients in past investigations (see Rabkin and Struening, 1976). There was a significant negative correlation, $r = -.16$ ($p < .02$), between stressful life events and income. This has been reported in previous literature (e.g. Dohrenwend and Dohrenwend, 1969). However, a significant correlation , $r = .17$ ($p < .02$), was also found between hardiness and income. When the sample is divided into those not living at home ($n = 46$) and those living with their parents ($n = 115$), a significant correlation between hardiness and income, $r = .19$ ($p < .02$), was found only for those living with their parent(s). The income of those living with their parent(s) includes the income of the parent(s) as well as the student's and as such does not represent the true income or future potential income of the student. It was not possible to exclude the income of parent(s) if the student lived with the parent(s) and it was not possible, from the data obtained to separate the student's income from the income of the parent(s) in the analyses. The correlation between age and income was $-.24$ ($p < .001$). Although this is a

significant negative correlation, it seems counterintuitive that as the older one gets, the less one's income is. Separating the subjects into those who live with their parents and those not living at home shows a significant negative correlation, $r = -.34$ ($p < .01$), only for those not living at home. What should be taken into account is the source of these students' incomes. Very likely the younger the student the more financial aid that is available to the student. Also, some students may not live with their parent(s) and yet be supported by their parent(s). In fact, twelve students who do not live with their parent(s) reported their income to be over $26,000 annually. The work status and living arrangements of these students are reported in Table 3. From this one can see that there seems to be very little relationship between the amount of work in the labor force and income. Thus income, in this study, becomes a meaningless variable.

Returning to Table 2 there was a significant correlation between gender and POMS depression, STAI anxiety, and Beck depression (all $p < .01$). The literature has reported significantly greater depression among women than men (Amenson and Lewinsohn, 1981; Weissman and Klerman, 1977; Uhlenhuth and Paykel, 1973). Indeed, a t-test between males and females found greater depression among women on both the POMS depression scale ($p < .05$) and the Beck depression inventory ($p < .01$). There was also a significant difference between males and females on the STAI anxiety scale ($p < .01$) with females reporting

Table 3

Work status and living arrangements of students with incomes over $26,000 annually

Gender	Age	Work Status	Living Arrangements
M	19	part time	alone
M	19	none	alone
M	19	part time	roomate
M	20	part time	roomate
M	19	occasionally	roomate
F	18	none	roomate
F	19	none	roomate
F	19	occasionally	relative
F	19	part time	relative
M	19	part time	relative
F	19	part time	relative
M	19	none	relative

greater anxiety.

In Table 2 there was a significant negative correlation between income and POMS depression, STAI anxiety, and Beck depression (all $p <$ .01). The same literature mentioned above also refers to those of lower socioeconomic status as having more psychological symptoms. As previously stated, however, the income of these subjects does not present a true picture of their income alone as these findings may be a measure of the socioeconomic status of the parent(s).

The correlations between the raw scores and the standard scores for POMS anxiety , POMS depression, and STAI anxiety measures were .98, .98, and .97, respectively. Since the Beck depression scale does not have standardized scores for college students, it was decided to use the raw scores in all the data analyses.

Data Analyses for Hypotheses

Hypothesis 1 stated that the more stressful life events college sophomores and juniors experience, the greater the evidence of psychological impairment. As can once again be seen in Table 2, there are significant positive correlations between stressful life events and psychological impairment as predicted by hypothesis 1.

Hypothesis 2 stated that among those sophomores and juniors who experience stress, the social science/humanities majors will show evidence of greater psychological impairment than those who are

science/mathematics majors. Using a median split, *t*-tests were performed for those classified as high stress subjects across major, social science/humanities (n = 50) versus science/mathematics (n = 30). While the means for each group were in the expected direction on the four outcome measures (POMS anxiety and depression, STAI anxiety and Beck depression), there were no significant differences between the two groups of subjects broken down by major. Thus, hypothesis 2 was not supported.

Hypothesis 3 stated that college sophomores and juniors who score high on hardiness will be less psychologically impaired than those low on hardiness. The last relevant result of Table 2, shows that the correlations between hardiness and the four outcome measures are highly significant in the predicted direction. Using a median split (median = -.328) for hardiness, *t*-tests were performed between low and high hardy subjects on the four outcome measures (POMS anxiety and depression, STAI anxiety and Beck depression). These results are found in Table 4 and indicated significantly less psychological impairment on all four outcome measures for the high hardy individuals. Thus, hypothesis 3 was supported.

The fourth hypothesis was that college sophomores and juniors who are under high stress and measure high on hardiness will report significantly less psychological impairment than those students who are under high stress and are low on hardiness. A two-way analysis of

Table 4

Means for impairment measures for low hardy and high hardy subjects

	Low Hardy(n=81)	High Hardy(n=81)
POMS anxiety	15.19	10.46***
STAI anxiety[a]	46.19	38.00***
POMS depression	14.83	8.56***
Beck depression[a]	9.34	5.63***

*** differs from low hardy group, $p < .001$
[a] for these two groups, for low hardy subjects, $n=80$, for high hardy subjects, $n=82$

variance using hardiness and stressful life events as the independent variables found significant main effects for hardiness, but not for stressful life events, on all four outcome measures (all $p < .001$). The interaction effect of stressful life events and hardiness on trait anxiety approached significance ($p = .069$) as did the interaction effect of stressful life events and hardiness on Beck depression ($p = .054$).

To further investigate hypothesis 4, hierarchical multiple regression analyses, entering stressful life events first, hardiness second, and the interaction term last, were run with four measures of psychological impairment (POMS anxiety, POMS depression, STAI anxiety and Beck depression) as dependent variables. However, whenever one uses multiplicative terms, multicollinearity may become a problem if there is a high correlation between the interaction term and one of the independent variables. In this study, the correlation between the interaction term and hardiness was .89 (considered extreme multicollinearity) and affected the results. When multicollinearity occurs, several approaches seem appropriate such as, entering the interaction term alone or conducting separate regressions for high stress students and low stress students. The most systematic way of examining the contribution of the interaction to the explained variation is to employ an F ratio using the incremental sum of squares regression (with the interaction term-without the interaction term) in the numerator (Anderson, 1958; Scheffé, 1959).

Table 5

Incremental sum of squares as a function of four outcome measures

Measure	Incremental Sum of Squares	*F*
POMS anxiety	10.55	.21
POMS depression	292.78	2.83[a]
STAI anxiety	116.45	1.44
Beck depression	224.69	6.08*

* $p < .02$
[a] $p < .10$

The interaction term is significant for Beck depression, F (1,158)= 6.08, $p < .02$, marginally significant for POMS depression, $F(1,158)$= 2.83, $p < .10$, and not significant for POMS anxiety and STAI anxiety and is shown in Table 5. Given the high correlation between hardiness and the interaction term, it was difficult to expect the interaction term to predict more significance above the main effects. Plotting the four dependent variables with both high and low stress and high and low hardiness shows the interaction effect of Beck depression and the non-significant effects of the other outcome measures. These effects are illustrated in Figures 2 through 5. These figures demonstrate that the measures of impairment are different for low hardiness subjects depending upon whether they are under high or low stress. In all four cases the high stress subjects exhibited higher levels of impairment. For the high hardiness subjects the differences in impairment between high and low stress subjects were minimal. Thus, despite the difficulty with the regression analyses hypothesis 4 was partially supported.

Table 6 shows the means of the outcome measures for high stress students determined by a median split and broken down by high and low hardiness. T-tests were used to examine differences between these means. All the differences were significant ($p < .001$). Table 7 shows the means of the outcome measures for low stress students according to a median split broken down by high and low

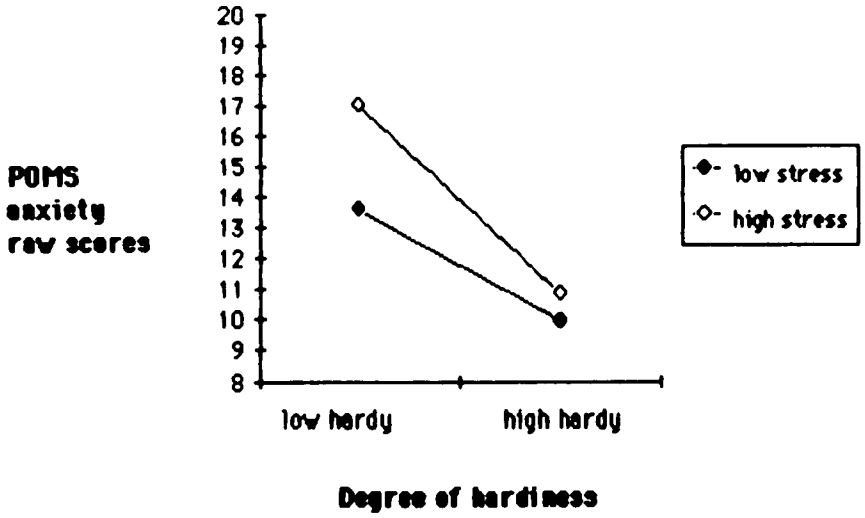

Figure 2. Effect of hardiness and stressful life events on POMS anxiety

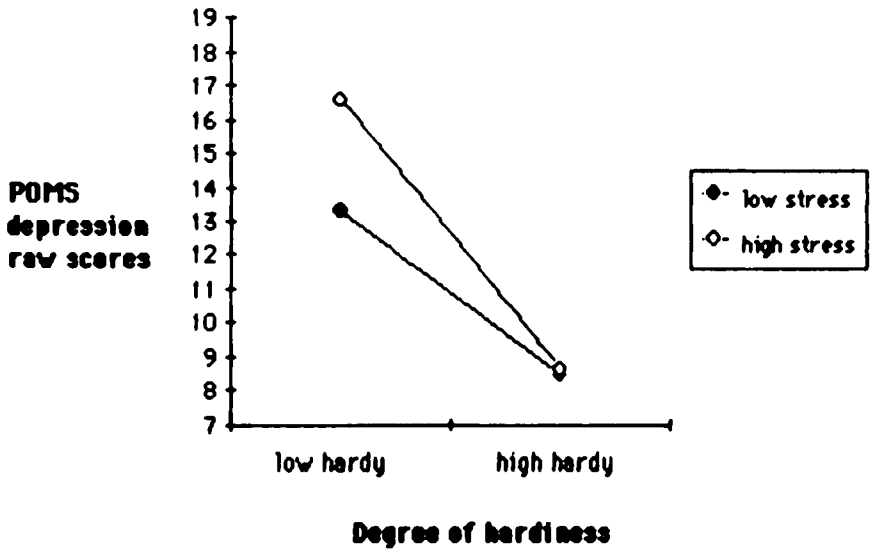

Figure 3. Effect of hardiness and stressful life events on POMS depression

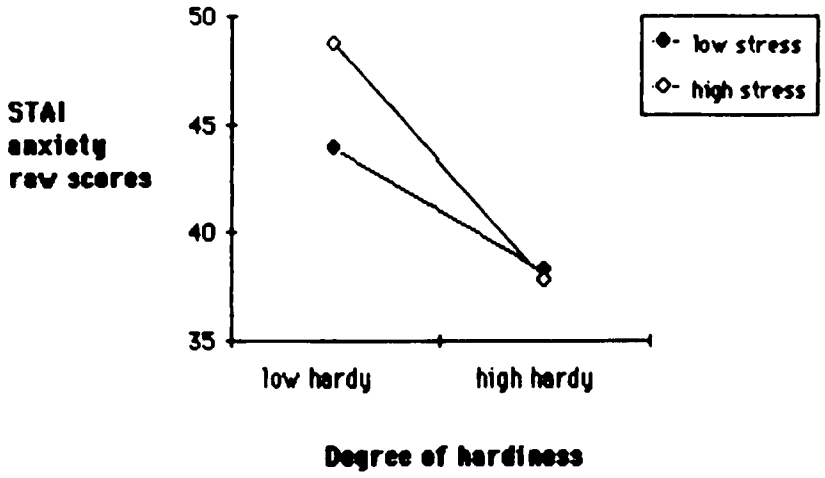

Figure 4. Effect of hardiness and stressful life events on STAI anxiety

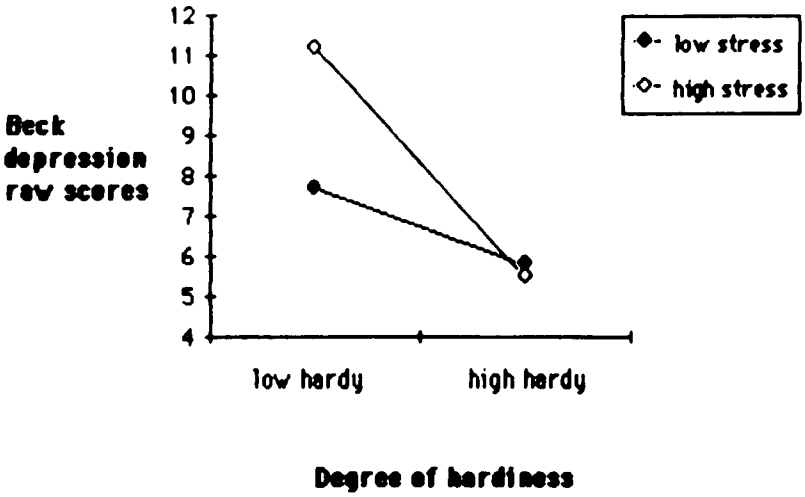

Figure 5. Interaction effect of hardiness and stressful life events on Beck depression

Table 6

Examination of outcome measures according to hardiness for high stress students

Outcome Measure	Low Hardiness(n=38)	High Hardiness(n=42)
POMS anxiety	16.97	10.90***
STAI anxiety[a]	48.74	37.77***
POMS depression	16.55	8.62***
Beck depression[a]	11.18	5.51***

*** differs from low hardiness group, $p < .001$
[a] for these measures, for high hardiness group, $n=43$.

Table 7

Examination of outcome measures for low stress students according to hardiness

Outcome Measure	Low Hardiness(n=43)	High Hardiness(n=39)
POMS anxiety	13.6	9.97*
STAI anxiety[a]	43.88	38.20**
POMS depression	13.3	8.49*
Beck depression[a]	7.67	5.77

* differs from low hardiness group, $p < .05$
** differs from low hardiness group, $p < .01$
[a] for these measures, for low hardiness group, $n=42$

hardiness. The *t*-test differences between the means for these outcome measures show significant differences for the two POMS measures (both $p < .05$) and the STAI anxiety measure ($p < .01$).

The fifth hypothesis stated that college sophomores and juniors who major in areas atypical for their gender will show evidence of more hardiness and less psychological impairment than those students who are in majors stereotypical for their gender. A two-way analysis of variance found no significant main effects for major or gender on hardiness; however, a significant interaction effect, $F(1, 162) = 4.44$, $p < .04$, was found. These results are illustrated in Table 8 and indicate that the men and women who chose atypical majors (e.g. men in nursing and women in business) are hardier (z scores of 1.51 and .25 respectively) than those students who chose typical majors (z scores of -.60 and -.50). Virtually no difference is found between the means of women in social science/humanities and men in science/mathematics (z scores of -.60 and -.50 respectively). However, a significant difference between these means and the means of men in social science/humanities and women in science/mathematics ($z = 1.51$ and .25 respectively) exists and accounts for the significant interaction. This interaction effect is illustrated in Figure 6.

Table 8

Mean hardiness standard scores according to major and gender

	Gender	
Major	Women	Men
Social science/ humanities	-0.60(n=62)	1.51(n=28)
Science/mathematics	0.25(n=42)	-0.50(n=31)

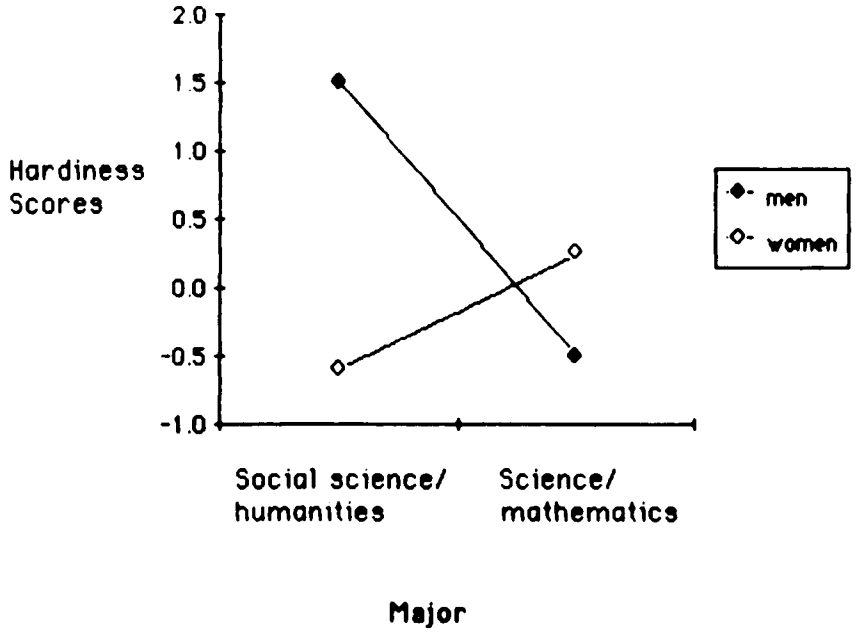

Figure 6. Interaction effect of gender and major on hardiness

Two-way analyses of variance were performed for major and gender on POMS anxiety and depression, STAI anxiety, and Beck depression. There was a significant main effect of gender on POMS depression, $F(1, 161) = 5.10$, $p < .03$, a significant main effect of gender on STAI anxiety, $F(1, 161) = 8.55$, $p < .004$, and a significant main effect of gender on Beck depression, $F(1, 161) = 7.58$, $p < .007$.

As can be seen in Table 9, the means on the POMS depression scale for both men and women in the science/mathematics majors are not significantly different. However, the means for the men in social science/humanities are significantly less than for women in social science/humanities ($p < .01$). This finding is consistent with the significant correlations between gender and POMS depression mentioned earlier. Looking at Table 10, women in science/mathematics have slightly (but not significantly) higher STAI anxiety means than men in science/mathematics. However, women in social science/humanities do have significantly higher means than men in social science/humanities ($p < .01$), thus accounting for the main effect of gender on STAI anxiety. The Beck depression means, as shown in Table 11, for both men and women in science/mathematics are not significantly different. Women in social science/humanities, however, report more depression than men in social science/humanities ($p < .001$). This is in agreement with the literature cited above that states women report more depression than men in the general population.

Table 9

POMS depression means according to major and gender

	Gender	
Major	Women	Men
Social science/humanities	14.77(n=62)	7.82(n=28)
Science/mathematics	10.81(n=42)	10.17(n=30)

Table 10

STAI anxiety means according to major and gender

	Gender	
Major	Women	Men
Social science/humanities	44.61(n=61)	37.68(n=28)
Science/mathematics	42.57(n=42)	40.16(n=31)

Table 11

Beck depression means according to major and gender

	Gender	
Major	Women	Men
Social science/humanities	9.20(n=61)	4.82(n=28)
Science/mathematics	7.57(n=42)	6.29(n=31)

Since significant findings were obtained in the analyses of variance for hypothesis 4, *t*-tests were performed between typical and atypical sophomores and juniors on hardiness, POMS anxiety and depression, STAI anxiety, and Beck depression. Table 12 shows significant differences. The first is between the typical and atypical majors on hardiness, with the atypical majors demonstrating hardier personalities. The second shows that the only measure of psychological impairment on which the atypical and typical majors differed significantly was the POMS depression with the typical majors reporting greater depression($p < .05$).

Hypothesis 5(a) stated that women sophomores and juniors who major in science/mathematics would be higher on hardiness and report less psychological impairment than women who major in social science/humanities areas. When examining women who major in social science/humanities with women who major in science/mathematics, no significant difference was found between them on hardiness or three measures of psychological impairment. On one of the measures of depression (POMS depression) a marginally significant difference ($p < .06$) was found. These findings are shown in Table 13. Hypothesis 5(b) stated that men who major in social science/humanities would be higher on hardiness and report less psychological impairment than men who major in science/mathematics areas. Similar to the women, men in science/mathematics were not significantly different from men in

Table 12

Hardiness and psychological impairment means for subjects in typical and atypical majors

Measure	Typical(n=92)	Atypical(n=70)
Hardiness[a]	.56	-.75*
POMS anxiety	13.38	11.80
STAI anxiety	43.11	40.61
POMS depression	13.27	9.61*
Beck depression	8.22	6.47

* differs from typical group, $p < .05$
[a] for this measure, for the typical group, $n=93$

Table 13

Hardiness and psychological impairment means for female subjects in typical and atypical majors

Measure	Typical(n=62)	Atypical(n=42)
Hardiness	-.60	.25
POMS anxiety	14.24	11.57
STAI anxiety[a]	44.61	44.57
POMS depression	14.77	10.81[b]
Beck depression[a]	9.20	7.57

[a] for these measures, for the typical group, n=61
[b] differs from typical group, p<.06

social science/humanities on hardiness or on any of the four measures of psychological impairment. These findings are shown in Table 14. Thus, hypotheses 5a & b were not supported.

Table 14

Hardiness and psychological impairment means for male subjects in typical and atypical majors

Measure	Typical(n=31)	Atypical(n=28)
Hardiness	-.50	1.51
POMS anxiety[a]	12.27	12.14
STAI anxiety	40.16	37.68
POMS depression[a]	10.17	7.82
Beck depression	6.29	4.82

[a] for these measures, for the typical group, n=30

Chapter 7

DISCUSSION

Summary of Major Findings

Overall there were several important findings. It is very clear that the more stressful life events one experiences, the more psychological impairment and the hardier the individual, the less psychological impairment. The social science/humanities majors are not significantly more depressed or anxious than are the science/mathematics majors. There is some support for previous research indicating that the hardy personality style ameliorates the effects (depression) of stress. A more interesting finding is that students who major in gender atypical (non-traditional) areas are hardier than gender typical (traditional) majors. In addition, women in typical majors report the greatest amount of depression and anxiety. Using psychological outcomes may be more confounding than using physical ones, however, two measures for each outcome variable were used to decrease the likelihood of such an occurrence. There is no evidence that these measures are affected by social desirability and any item overlap would not be expected to affect the outcomes here.

Stress and Impairment

The results of this study support previous findings (e.g., see Rabkin and Struening, 1976) that the more stressful life events that occur in one's life, the greater the psychological impairment. While the correlations are significant, they are low and account for only three to four percent of the variance, indicating that the relationship is quite modest. In examining the main effects of stressful life events on depression and anxiety, none were found. A possible reason that main effects were not obtained is that in using median splits for stressful life events, differences within high subjects and low subjects are lost. Such is not the case for straight correlations.

Hardiness and Impairment

When looking at the results it is clear that the hardier the college sophomore or junior, the less the psychological impairment. Clearly, these findings are stronger than the results for stress and impairment. The correlations account for nine to 18% of the variance and the main effects on depression and anxiety were all highly significant. Thus, it seems that a hardy personality is a better predictor of less impairment than are stressful life events indicating more impairment.

This finding, that the hardier the student the less psychological impairment, is an interesting one since this is the first time that hardiness results have been reported with college students. The hardy personality type had been found for male business executives and

lawyers (Kobasa, 1982a and b) who are in the 35-65 age range. The three components of hardiness (committment, challenge, and control) are found in college students, regardless of the gender of the student.

This finding indicates two important points. First, the hardy personality type already seems to be well developed in the college student. College students have as much committment to their college studies in a particular area of specialization and as much committment to themselves as do the executives and lawyers (Kobasa, 1979; 1982a and b). Certainly students who remain after the first year of college have a great sense of commitment to staying in college and pursuing a degree (Bloom, 1975). College students and executives and lawyers however, differ in certain ways. College students have the option to withdraw from a course that they dislike or find too difficult. Executives, lawyers and anyone in a career oriented position does not usually have the option to refuse a work assignment. Rather, the expectation is that the career person will perform well in a work project. College students can change their major if they feel it is inappropriate for them or will not lead to the career in which they are currently interested. Professional persons would consider a career change very seriously along with all the ramifications of such a change, for example location, salary, etc. While there are differences between studying in college and being successful in a chosen career, the committment and dedication to whichever is undertaken is obviously

there for both groups.

With regard to the challenge component of hardiness, students view their courses in college as stimulating, in much the same way that successful executives and lawyers(Kobasa, 1979; 1982a and b) see their work related projects and goals. Hardy executives and lawyers constantly need stimulation on their jobs and seek new challenges rather than stagnate in a work situation. Likewise, hardy college students seek courses that are diversified and offer them challenges. As these students proceed through the college years there are many opportunities for personal growth and they respond to these challenges with interest and enthusiasm. Change is anticipated and coped with effectively.

As for the control component, hardy college students may feel that they have control over their course of studies and other aspects of their lives including stressful life events. These hardier students may have more of an internal locus of control and do not attribute the outcome of an event to fate, luck or chance. Hardy students who do not perform well in a course may try to find ways of improving their ability to succeed in the course. They may not feel that the poor grade is a reflection of the teaching style or bad luck. Having a sense of control over one's life gives the student a feeling of powerfulness, which in turn promotes healthfulness and an ability to cope with life's changes.

Hardiness in Women

The second important implication of the finding that the hardier the student the less the psychological impairment is that some female sophomores and juniors also demonstrate a hardy personality. Only one study to date has investigated the hardiness of women with all other research focused on men. Kobasa (1982b) found that 40 women who were high in stressful life events and low in psychiatric symptomatology were indeed hardier than the 60 women who were high on stress and high in psychiatric symptomatology. All of Kobasa's subjects were married, middle class, and working on a full time basis. These women were quite different from the female college students in this study who were single, attended school on a full time basis and represented all socioeconomic levels. Nevertheless, college women appear to have a committment to their studies, control over their lives, and the tendency to approach challenging situations as do the men and women reported in previous research.

The original work on sex-role stereotypes (Bem, 1974) indicated certain characteristics around which the adjectives individuals assigned to themselves revolved. For females, these were emotional expressiveness or warmth while for males the characteristics were aggressiveness, competitiveness and dominance. During the past ten years a shift has occurred in social attitudes. The women's movement has encouraged women to acquire the masculine traits of independence,

competitiveness and aggression but there has been no "men's movement" to increase a man's sense of emotional expressiveness, nuturance and caring. Collins (1985) suggests that it is easier for women to develop masculine characteristics than for men to show an interest in feminine characteristics as the masculine role has the greater social value. Perhaps the male "macho image" prevents the inclusion of these traits in their behavior. It seems that there are less negative values assigned to male traits but not so for female traits. Katz (1975) emphasized that with the changes in women's roles, women are challenging the lack of sensitivity and emotional involvement in men. He suggests that men learn how to be more expressive and caring. Women may now view themselves not only as nuturing and warm but also as assertive and competitive.

In the past most women have been socially conditioned to assume stereotypically feminine behaviors of non-assertiveness, powerlessnesss, and an inability to control events in their lives (Frieze, Parsons, Johnson, Ruble, and Zellman, 1978; Rohrbaugh, 1979). Many women view life events as threatening and feel inadequate to handle them appropriately. Certainly this is not the case for female sophomores and juniors in this study. Obviously there are some women who have learned that life is a challenge and that attending college can be a stimulating and exciting experience and that they can choose which area to specialize in as well as which courses to take. During previous

years a much larger proportion of women did not really choose courses based on their personal interests and career plans, but selected ones that were considered appropriate for their gender and their future role of wife and mother.

Hardiness and Stress

One of the purposes of this research project was to investigate the extent to which the hardy personality moderates the effects of stressful life events. Hardiness was found to have a highly significant effect on psychological impairment for those who were under high stress. A significant effect, however, was also found for those students who were hardy but had a low number of stressful life events. This finding differs from previous reports in that the hardy personality was shown to influence psychological impairment regardless of stress level.

Specifically, hardier students who had less stress showed significantly less impairment on both anxiety measures and the POMS depression measure than low hardy/low stress students. All of the psychological impairment scores were significantly lower for the high hardy/high stress students than those students who were low in hardiness and high in stressful life events. While the findings do indicate that hardiness acts a buffer for depression, it is of greater importance for predicting both anxiety and depression than stressful life events.

Atypical (Non-traditional) Majors

Perhaps the most interesting finding of this study is that sophomores and juniors who chose to major in areas atypical for their gender have significantly hardier personalities than students who pursue areas of specialization that are congruent with traditional standards. Women who major in science/mathematics and men majoring in social science/humanities are hardier than women who major in social science/humanities and men who major in science/mathematics.

Referring back to Erickson's (1963) psychosocial developmental theory, there has been a shift up the scale for college students. Since students are experiencing some role confusion and clearly searching for an identity, they are in stage five, identity vs. role confusion and not stage six, intimacy vs. isolation. The focus of the college years, for sophomores and juniors, is not seeking mutuality with a loved partner and procreation; but rather searching for a sense of well-being, belonging and a new identity through sex-role behavior, choice of major, a system of values and pursuit of career.

In the past, women have been encouraged to pursue majors in college that would relate to their future as a homemaker and a mother or for the traditional "caretaker" job, e.g., teaching, nursing, etc. Previously, women have primarily majored in the social science/humanities areas, such as education, nutrition, child

development, etc. Over the past twenty years however, women began to express an interest in and a desire to pursue courses not typical for their gender. Subsequently, the career patterns of women have been changing and more women are entering fields traditionally dominated by men, such as business, law, medicine, engineering, accounting, marketing, and management. For college women to be effective in these non traditional areas they must possess certain qualities in order to pursue their course of studies as well as realize their future work goals.

Women who seek traditionally male dominated areas/careers appear to have certain personal characteristics needed to carry out activities involved in this process. These women are more dedicated and committed to themselves and their studies/work. They do not feel powerless or helpless but actively chose which areas to major in and which courses to take. In addition, they pursue studies and/or careers which are dynamic and challening and not boring for them.

The other portion of the atypical sample reflecting hardier personalities is represented by men. These are men majoring in the social science/humanities areas. According to the reports of Bereiter and Freedman (1962) men were considered "abnormal" if they pursued a degree in the social science/humanities. This may have occurred because males majoring in the social science/humanities areas were perceived as less "manly" than males in the more traditional majors.

Perhaps males who enter into gender atypical fields have to be hardier in order to pursue these areas or perhaps one becomes hardier because of the challenges met in having an atypical major. Much has been written about women entering traditionally male dominated fields (e.g. business) but relatively little has been said about males who enter female dominated areas (e.g. nursing). It is possible that because this is so unique that men are readily accepted into these areas and demonstrate the characteristics of hardiness. Thus, men who major in the social science/humanities areas show a greater sense of commitment to their studies, have more personal control over situations, and view their studies as a challenge.

One interesting finding is that women who are in typical majors (social science/humanities) report significantly more depression than men who are in atypical majors (social science/humanities). There are no significant differences between the depression scores of men and women who choose science/mathematics majors. This was true for both outcome measures of depression. It seems then that the women who choose the more traditional roles by the selection of a typical major report significantly more depression. In the literature women are diagnosed with depression at a 2:1 sex ratio in a fairly consistent manner (Guttentag, Salasin, and Belle, 1980). Researchers have tried to account for these differences and found that while there are no significant differences in the experience or reporting of stressful life

events, women report and seek help more often than men for depressive symptoms (Guttentag, Salasin, and Belle, 1980). In this study, there were no significant difference between the stressful life event scores of men and women.

Since women do not report more stressful life events than men in the general population it is not clear what accounts for the seemingly greater depression of women. One popular explanation is that women are traditionally seen as being of lower status than men because of their housewife and/or poorer paying jobs and subsequently experience more depressive symptoms. According to this explanation, women find their life situations (economic inadequacies, dependency on others, low aspirations, and poor self-esteem) as being discriminatory against them and become chronically depressed (Weissman, 1980). This may account for women in traditional majors experiencing more depression than women who are in cross-gender majors. It seems that women in science/mathematics areas may have higher aspirations and better self-esteem than women who major in social science/humanities. In other words, the female sophomores and juniors who are in atypical gender majors and are indeed hardier, may utilize this hardy personality style to give them greater committment to and control over their studies and see their courses in college as challenging. Thus this personality style increases their self-esteem, aspirations, and independence with subsequent increase in status and prestige.

Another explanation is that women internalize their role expectations and experience learned helplessness (Guttentag, Salasin and Belle 1980). As mentioned earlier, young girls are socialized into the traditional feminine characteristics (Collins, 1985; Williams, 1983). These chacteristics encourage the young girl to behave in warm, expressive, dependent, and helpless ways. The model of learned helplessness proposes that women, because of their dependency and lower status, have less of a sense of control over their lives and respond negatively to change in most situations with subsequent depression. The most convincing evidence of how sex-role socialization affects the higher rates of depression in women comes from the data on marital status and depression. Women who have chosen a traditional path—at home with small children— show evidence of greater depression than women who are unmarried and have carrers (Weissman, 1980). This would describe women who have chosen traditional majors and are less hardy than women who are in atypical majors for their gender. As the findings of this study indicated, women who are in traditional majors have significantly more depression than women in atypical majors and men in either the social science/humanities or science/mathematics.

On one of the anxiety measures, the STAI inventory, women in the social science/humanities areas have significantly higher means than men in social science/humanities. There were no differences between

men and women in the science/mathematics majors. Guttentag, Salasin and Belle (1980) reports the results of some studies that have investigated psychoneurotic behavior and found that women obtained higher scores on anxiety than men. Men on the other hand, demonstrated more symptoms of personality disorders than women. It is not clear if women actually experience more anxiety or are more expressive about their feelings of anxiousness.

The longitudinal study done by Rauste-von Wright et al (1981) seems to have some relevance for this finding on the greater anxiety of women in social science/humanities. Their findings indicated that 18 year old males reported less anxiety and more adrenaline excretion than females during achievement oriented stress situations. If males, in general, are less anxious than females, this would explain why neither anxiety measures was significant for either the men in social science/humanities or science/mathematics majors. Rauste-von Wright et al (1981) also found that women did experience more psychological responses than men, overall, and did excrete as much adrenaline as men during stress when their goal was a non-traditional feminine role. One can extrapolate from this data and expect to find similar results for women and men in science/mathematics on anxiety measures. And it has already been demonstrated that students who are in atypical majors for their gender are indeed hardier than those who pursue traditional majors. Thus, we can generalize these findings to say that

women who are in traditional majors, and not as hardy as the atypical men, would experience more anxiety and explain why this study found women in social science/humanities to have significantly more anxiety than men in social science/humanities.

Limitations

When looking at the psychological impairment of the high stress students, no differences were seen between the two major categories, social science/humanities and science/mathematics. Certainly this does not replicate the reports of Bereiter and Freedman (1962) who cite seven studies stating that the social science majors report more psychological problems than the natural science/applied science (e.g. business, engineering) majors. While the statistical analyses were different (proportions and percentages in the Bereiter and Freedman reports vs. correlations and *t*-tests in this study), these do not seem to account for the dissimilarity of the two findings. Students who major in the social science/humanities report more, but not significantly more, anxiety and depression (with the exception of the female students and depression mentioned earlier). Thus, it seems that science/mathematics students are as aware of psychological problems, and report them almost as frequently, as the social science/humanities students.

When women in social science/humanities were compared with women in science/mathematics on hardiness and the four outcome

measures, there was marginal significance for women in science/mathematics as having less depression. Comparing men in the atypical versus typical categories found no significant differences between men in social science/humanities and men in science/mathematics. One possible reason for this lack of significance (while finding significance when comparing typical and atypical majors overall) is that the small subsamples did not allow for important differences to emerge.

In retrospect there are other ways in which one can investigate the data for these New York City students. One way is to look at the ethnic background and examine the proportion of students in different majors. Another way is to look at what major is typical (traditional) for one's gender and not the social sciences versus the sciences or to look at the gender composition of particular majors (e.g. men in nursing and women in engineering). Finally, an investigation could be done into the stressful life events themselves and see which individual events play a role in both identity and sex-role issues.

Future Research

Based on the above limitations, futher studies should involve not only larger subsamples but also samples from different student populations. This findings were based on students from a New York City population. Perhaps students who live away from their parents/families and friends, and who are in a rural, or less urban

area would report somewhat different stressful life events, personality types, and psychological impairment scores. In addition, another study could focus on categories (school, work,family, etc. and positive versus negative), as well as individual stressful life events, and further refine the methodological issues using the current instrument.

One direction for future research is to expand on the knowledge of chosing an atypical major for one's gender and see if this extends to chosen careers as well. When students chose non-traditional majors, a prospective study would allow for exploration of their personality types and future occupations. If a student who is not hardy chooses an atypical major, it could be hypothesized that this student may subsequently switch to a major that is more compatible with their personality style of hardiness. This is similar to students who change to a major that is more compatible with their cognitive style (field-dependent vs. field-independent). Also, research could be done investigating gender atypical majors, hardiness, and achievement orientation and/or behavior. Using these variables, in a number of ways, one could predict success in a particular major, who is more likely to show a hardy personality type, what happens to the achievement scores of those who are not hardy, and comparing a student's cognitive style with their hardy personality style.

It would also be important to find out if hardiness is a moderator of

stressful life events for women executives and lawyers. While previous research excluded these women, the inclusion of them would increase our knowledge of successful individuals' (and particularly womens') personalities and their coping skills. Incorporated into this type of study could be an investigation of the sex-role concepts of both men and women. It is anticipated that both genders who have hardy personalities would also score as androgynous on the Bem Sex-Role Inventory (1974) and demonstrate both feminine and masculine traits.

Now that it has been demonstrated that college students are indeed hardy, the question arises of how and when does hardiness begin. Is it the genetic predisposition of the individual or the role models that a person relates to as developmental growth takes place? Certainly this study is one step in the direction of investigating the importance and selection of role models for college students. Female professors are under represented on college and university faculties in the United States, even in fields of study that are traditionally female dominated such as art history and english (Williams, 1983). Thus male professors are in the majority in colleges. Rossi (1965) found that women who have chosen atypical majors have mothers who were highly educated and in professional jobs outside the home. While there seems to be an adequate supply of male role models, both at home and in the college, female role models are lacking. Since female college students are hardy and chosing atypical majors, who are the role

models available to them and which role models (home or college) are of greater significance?

Since the investigation of role models seems justified, then one needs to look at sex-role socialization and how and when the hardy personality begins and the interaction of sex-role, role models, and personality style. Does hardiness develop in infancy or in high school or somewhere along the continuum? Perhaps, and this seems likely, when a college student chooses an atypical major, either they are hardy to do so or become hardy in order to succeed in their course of studies. Looking at the development of this personality type can help one to find out how it ameliorates the negative psychological effects of stressful life events and how it functions with other moderators.

APPENDIX A

PROJECT QUESTIONNAIRE

This is a questionnaire about various aspects of your life. We are interested in finding out what kinds of feelings, experiences, personal views, and social supports you have. The questionnaire will take approximately 45 minutes and directions are given for each section. Each person is different, so there are no "right" or "wrong" answers. In order to maintain anonymity and confidentiality, do not put your name on this questionnaire.

PLEASE READ THE INSTRUCTIONS FOR EACH SECTION CAREFULLY.

Please fill in the blanks or circle the appropriate letter or number below.

Gender: M F

Age: _____years

Marital Status: Single M W D Separated

Race: W B Hisp. Other

Do you live:
1- alone
2- with a roommate(s)
3- with a spouse
4- with a parent(s)
5- with a relative(s)

What is your income? If you live with your parents, add your income to their income to arrive at a total income for the household.

1- under $6000
2- $6000 - $10,999
3- $11,000 - $15,999
4- $16,000 - $20,999
5- $21,000 - $25,999
6- $26,000 - $29,999
7- $30,000 and over

Do you attend college:

1- full time (12 or more credits each semester)
2- part time(less than 12 credits each semester)

In addition to attending college, do you work:

1- full time
2- part time
3- occasionally (e.g. babysitting)
4- not at all

What is your major field of study:_____
(or what you think will be your major)

Place a check over the number of college credits that you have now.

_____	_____	_____	_____
(under 30)	(31-60)	(61-90)	(over 90)

PERSONAL VIEWS
(Hardy personality style)

Here are some attitudes and opinions with which you might agree or disagree. As you will see, many of the items are strongly worded. This is to help you decide HOW MUCH you agree or disagree with each one. Please indicate your reaction to each item by circling the appropriate number through use of the following scheme:

0- STRONGLY DISAGREE
1- MILDLY DISAGREE
2- MILDLY AGREE
3- STRONGLY AGREE

1-	0 1 2 3	I wonder why I work at all on college and the other projects in my life.
2-	0 1 2 3	The human's fabled ability to think is not really such an advantage.
3-	0 1 2 3	One who does one's best should expect to receive complete economic support from one's society.
4-	0 1 2 3	When I make plans I am certain I can make them work.
5-	0 1 2 3	Politicians control our lives.
6-	0 1 2 3	Most of life is wasted in meaningless activity.
7-	0 1 2 3	I don't like conversations when others are confused about what they mean to say.
8-	0 1 2 3	The attempt to know yourself is a waste of effort.
9-	0 1 2 3	There are no conditions which justify endangering the health, food, and shelter of one's family or of one's self.
10-	0 1 2 3	When you marry you have lost your freedom of choice.
11-	0 1 2 3	Most of my activities are determined by what society demands.

0- STRONGLY DISAGREE
1- MILDLY DISAGREE
2- MILDLY AGREE
3- STRONGLY AGREE

12- 0 1 2 3 I often wake up eager to take up my life where it left off the day before.

13- 0 1 2 3 If you have to work, you might as well as choose a career where you deal with matters of life and death.

14- 0 1 2 3 I am really interested in the possibility of expanding my consciousness through drugs.

15- 0 1 2 3 Planning ahead can help avoid most future problems.

16- 0 1 2 3 Pensions large enough to provide for dignified living are the right of all when age or illness prevents one from working.

17- 0 1 2 3 Those who work for a living are manipulated by their bosses.

18- 0 1 2 3 I really look forward to my work.

19- 0 1 2 3 Life is empty and has no meaning in it for me.

20- 0 1 2 3 I long for a simple life in which body needs are the most important things and decisions don't have to be made.

21- 0 1 2 3 I find it difficult to imagine enthusiasm concerning work.

22- 0 1 2 3 It doesn't bother me to step aside for a while from something I'm involved in.

23- 0 1 2 3 I find it hard to believe people who actually feel that the work they perform is of value to society.

24- 0 1 2 3 The most exciting things for me are my own fantasies.

0- STRONGLY DISAGREE
1- MILDLY DISAGREE
2- MILDLY AGREE
3- STRONGLY AGREE

25- 0 1 2 3 I tend to start right in on a new task without spending much time thinking about the best way to proceed.

26- 0 1 2 3 When I am at work performing a difficult task, I know when to ask for help.

27- 0 1 2 3 No matter how hard you work, you never seem to reach your goals.

28- 0 1 2 3 I feel uncomfortable if I need to make any changes in my everyday schedule.

29- 0 1 2 3 My work is carefully planned and organized before it is begun.

30- 0 1 2 3 I like to be with people who are unpredictable.

31- 0 1 2 3 It upsets me to go into a situation without knowing what I can expect from it.

32- 0 1 2 3 No matter how hard I try, my efforts accomplish nothing.

33- 0 1 2 3 A person who seldom changes his mind can usually be depended upon to have reliable judgment.

34- 0 1 2 3 I very seldom make detailed plans.

35- 0 1 2 3 It's exciting for me to learn something about myself.

36- 0 1 2 3 Before I ask a question, I figure out exactly what I know already and what it is I need to find out.

For the following items, please indicate which of the two statements provided in each of the listed pairs better represents your attitude. Circle the statement that you agree with more.

37- a. In the long run, people get the respect they deserve in this world.
b. Unfortunately, an individual's work often passes unrecognized, no matter how hard he tries.

38- a. The idea that most teachers are unfair to students is nonsense.
b. Most students don't realize the extent to which their grades are influenced by accidental happenings.

39- a. Without the right breaks, one cannot be an effective leader.
b. Capable people who fail to become leaders have not taken advantage of their opportunities.

40- a. Becoming a success is a matter of hard work; luck has little or nothing to do with it.
b. Getting a good job depends mainly on being in the right place at the right time.

41- a. In my case getting what I want has little or nothing to do with luck.
b. Many times we might as well decide what to do by flipping a coin.

42- a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
b. Getting people to do the right thing depends upon ability, luck has little to do with it.

43- a. Most people don't realize the extent to which their lives are controlled by accidental happenings.
b. There is really no such thing as "luck".

44- a. With enough effort, we can wipe out political corruption.
b. It is difficult for people to have control over things politicians do in office.

45- a. Many times I feel I have little influence over the things that happen to me.
b. It is impossible for me to believe that chance or luck plays an important role in my life.

46- a. What happens to me is my own doing.
b. Sometimes I feel that I don't have enough control over the direction my life is taking.

47- a. Most of the time I can't understand why politicians behave the way they do.
b. In the long run the people are responsible for bad government on a national as well as on a local basis.

SELF-EVALUATION
(Trait form of State-Trait Anxiety Inventory)

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the the number to the right of the statement to indicate how you *generally* feel. There are no right or worng answers. Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel using the following scheme.

1. Almost never
2. Sometimes
3. Often
4. Almost always

1.	I feel pleasant	1 2 3 4
2.	I tire quickly	1 2 3 4
3.	I feel like crying	1 2 3 4
4.	I wish I could be as happy as others seem to be	1 2 3 4
5.	I am losing out on things because I can't make up my mind soon enough.	1 2 3 4
6.	I feel rested.	1 2 3 4
7.	I am "calm, cool, and collected".	1 2 3 4
8.	I feel that difficulties are piling up so that I cannot overcome them.	1 2 3 4
9.	I worry too much over something that really doesn't matter.	1 2 3 4
10.	I am happy.	1 2 3 4
11.	I am inclined to take things hard.	1 2 3 4

1. Almost never
2. Sometimes
3. Often
4. Almost always

12. I lack self-confidence.	1 2 3 4
13. I feel secure.	1 2 3 4
14. I try to avoid facing a crisis or difficulty.	1 2 3 4
15. I feel blue.	1 2 3 4
16. I am content.	1 2 3 4
17. Some unimportant thought runs through my mind and bothers me.	1 2 3 4
18. I take disappointments so keenly that I can't put them out of my mind.	1 2 3 4
19. I am a steady person.	1 2 3 4
20. I become tense and upset when I think about my present concerns.	1 2 3 4

APPENDIX B

Major Categorization

Listed below are fields of study that college students choose to major in during their years in college. You are asked to place each of the following college majors into one of two categories: either humanities/social sciences or mathematics/sciences. For each major listed below place a category letter in the blank space provided.

H= humanities/social sciences
M= mathematics/science

1. M Accounting
2. H Advertising
3. H Anthropology
4. H Art
5. M Astronomy
6. M Biology
7. M Business
8. M Chemistry
9. M Chemical Engineering
10. H Communications
11. M Computer Science
12. M Computer Programming
13. H Creative and Performing Arts
14. M Economics
15. H Education
16. M Electrical Engineering
17. H English
18. M Finance
19. H Fine Arts
20. M Geology
21. H History
22. H Industrial Psychology
23. _____ Insurance

24. H Journalism
25. H Law
26. H Liberal Arts
27. H Library
28. M Management Science
29. M Marketing
30. M Mathematics
31. H Media
32. H Modern Languages
33. H Music
34. H Nursing
35. M Pathology
36. H Philosophy
37. H Physical and Health Education
38. H Physical Therapy
39. M Physics
40. H Political Science
41. H Psychology
42. H Public Administration
43. M Quantitative Analysis
44. H Real Estate
45. H Religion and Culture
46. H Romance Languages
47. H Sociology
48. H Speech
49. M Statistics
50. H Theater Arts

APPENDIX C

SOCIAL READJUSTMENT QUESTIONNAIRE

This is a questionnaire about life experiences that may or may not have happened to you. The questionnaire will take approximately 40 minutes and directions are given for both parts. In order to maintain anonymity and confidentiality, do not put your name on this questionnaire.

PLEASE READ THE INSTRUCTIONS FOR EACH SECTION CAREFULLY.

Please fill in the blanks or circle the appropriate letter or number below.

Gender: M F

Age: _____years

Marital Status: Single M W D Separated

Race: W B Hisp. Other

Do you live:
1- alone
2- with a roommate(s)
3- with a spouse
4- with a parent(s)
5- with a relative(s)

What is your income? If you live with your parents, add your income to their income to arrive at a total income for the household.

1- under $6000
2- $6000 - $10,999
3- $11,000 - $15,999
4- $16,000 - $20,999
5- $21,000 - $25,999
6- $26,000 - $29,999
7- $30,000 and over

In addition to attending college, do you work:

1- full time
2- part time
3- occasionally (e.g. babysitting)
4- not at all

What is your major field of study:_____
(or what you think will be your major)

Place a check over the number of college credits that you have now.

_____	_____	_____	_____
(under 30)	(31-60)	(61-90)	(over 90)

(A) Social readjustment includes the amount and duration of change in one's accustomed pattern of life resulting from various life events. As defined, social readjustment measures the intensity and length of time necessary to accommodate to a life event, regardless of the desirability of this event.

(B) You are asked to rate a series of life events as to their relative degrees of necessary adjustment. In scoring, use all of your experience in arriving at your answer. This means personal experience where it applies as well as what you have learned to be the case for others. Some persons accommodate to change more readily than others; some persons adjust with particular ease or difficulty to only certain events. Therefore, strive to give your opinion of the average degree of readjustment necessary for each event rather than the extreme.

(C) The mechanics of rating are these: Event 1, Marriage, has been given an arbitrary value of 500. As you complete each of the remaining events think to yourself, "Is this event indicative of more or less readjustment than marriage?" "Would the readjustment take longer or shorter to accomplish?" If you decide the readjustment is more intense and protracted, then choose a proportionately larger number (e.g. 501, 600, 725, 888, etc.) and place it in the blank directly opposite the event in the column marked "VALUES". If you decide the event represents less and shorter readjustment than marriage, then indicate how much less by placing a proportionately smaller number (e.g. 499, 400, 275, 112, etc.) in the opposite blank. (If an event requires intense readjustment over a short time span, it may approximate in value an event requiring less intense readjustment over a long period of time.) If the event is equal in social readjustment to marriage, record the number 500 opposite the event.

EVENTS	VALUES
1. Marriage	500
2. Changed to an easier major	
3. Promoted at work	
4. Female: had abortion	
5. Changed jobs	
6. Trouble with in-laws	
7. Left home for the first time	

8. Birth of a child _____
9. Failed an important exam _____
10. Marital reconciliation with spouse _____
11. Dropped a course _____
12. Major change in eating habits (much more or much less food intake) _____
13. Breaking up with boyfriend/girlfriend _____
14. Went on or off public assistance _____
15. Change in working conditions (different work responsibility, working hours, etc.) _____
16. Arrested _____
17. Involved in a love affair _____
18. Male: wife/girlfriend pregnant _____
19. Changed to a harder major _____
20. Major change in church, club or organization activities (increased or decreased participation) _____
21. Returned to college after not attending for two or more consecutive terms _____
22. Laid off from your job _____
23. Serious injury or illness of close family member _____
24. Divorce _____
25. Detention in jail or comparable institution _____
26. Serious quarrel with close friend _____
27. Reconciliation with boyfriend/girlfriend _____
28. Trouble with boss _____
29. Started college _____
30. Marital infidelity _____
31. Female: pregnant _____
32. Involved in a lawsuit or court case _____
33. Serious injury or illness of close friend _____
34. Spouse died _____
35. Moved to a less attractive residence _____
36. Dismissed from dormitory or other residence _____

37. Changed to a new college _____
38. Fired from your job _____
39. Started work for the first time _____
40. Major change in social activities, e.g. dates, parties, movies, visiting (increased or decreased participation) _____
41. Miscarriage or stillbirth _____
42. Took a vacation of at least one week _____
43. Major change in closeness of family members (increased or decreased closeness) _____
44. Major change in sleeping habits (much more or much less sleep) _____
45. Borrowed more than $10,000 (bought home, business, etc.) _____
46. Major change in living conditions of family (building new home, remodeling, deterioration of home, neighborhood, etc.) _____
47. Quit your job _____
48. Borrowed less than $10,000 (bought car, TV, got school loan, etc.) _____
49. Married female: change in husband's work (loss of job, beginning new job, etc.) _____
50. Married male: change in wife's work outside the home (beginning work, ceasing work, changing to a new job, etc.) _____
51. Failed a course _____
52. Academic probation _____
53. Relations with spouse changed (better or worse) _____
54. Child died _____
55. Family member other than spouse or child died _____
56. Became engaged _____
57. Demoted at work _____
58. Male: wife/girlfriend had abortion _____
59. Moved to a better residence _____
60. Major change in usual type and/or amount of recreation _____

61. Serious family argument other than with spouse _____
62. Physical illness or personal injury _____
63. Major change in financial status (a lot better off or a lot worse off) _____
64. Separated from spouse (due to work or travel) _____
65. Death of a close friend _____
66. Financial problems concerning school (in danger of not having sufficient money to continue) _____
67. Married couple separated (due to conflict) _____
68. Assaulted and/or robbed _____
69. Family member moved into household _____
70. Minor law violations (traffic tickets, disturbing the peace, etc.) _____
71. Made new friends _____
72. Sexual difficulties _____
73. Apartment or house burglarized _____

THIS IS THE END. THANK YOU FOR YOUR COOPERATION!

APPENDIX D

SOCIAL READJUSTMENT RATING SCALE
FOR COLLEGE STUDENTS (n=50)

Rank	Life Event	Mean Value
1	Child died	88
2	Family member other than spouse or child died	87
3	Spouse died	83
4	Miscarriage or stillbirth	67
5	Death of a close friend	67
6	Divorce	65
7	Birth of a child	65
8	Detention in jail or comparable institution	64
9	Financial problems concerning school	63
10	Serious injury or illness of close family member	63
11	Arrested	60
12	Female: pregnant	59
13	Married couple separated due to conflict	59
14	Assaulted and/or robbed	57
15	Marital infidelity	57
16	Major change in financial status	56
17	Physical illness or personal injury	55
18	Female: had abortion	54
19	Male: wife/girlfriend pregnant	54
20	Fired from your job	53
21	Left home for the first time	53
22	Laid off from your job	52
23	Serious injury or illness of close friend	51
24	Relations with spouse changed	50
25	Marriage	50
26	Separated from spouse due to work or travel	49
27	Became engaged	49
28	Marital reconciliation	48
29	Borrowed more than $10,000	48
30	Changed to a harder major	47
31	Academic probation	47
32	Major change in closeness of family members	47
33	Sexual difficulties	47
34	Involved in a lawsuit or court case	46

35	Demoted at work	46
36	Apartment or house burglarized	45
37	Family member moved into household	44
38	Involved in a love affair	44
39	Married male: change in wife's work outside home	44
40	Moved to a less attractive residence	43
41	Went on or off public assistance	43
42	Breaking up with boyfriend/girlfriend	42
43	Married female: change in husband's work	42
44	Returned to college after two terms out	42
45	Started college	41
46	Male: wife/girlfriend had abortion	41
47	Dismissed from dormitory or other residence	40
48	Major change in living conditions of family	40
49	Changed jobs	40
50	Quit your job	40
51	Failed a course	39
52	Started work for the first time	39
53	Failed an important exam	39
54	Serious family argument other than with spouse	38
55	Trouble with boss	38
56	Change in working conditions	37
57	Serious quarrel with close friend	37
58	Promoted at work	37
59	Changed to a new college	36
60	Reconciliation with boyfriend/girlfriend	36
61	Trouble with in-laws	36
62	Moved to a better residence	34
63	Major change in social activities	34
64	Major change in eating habits	34
65	Major change in sleeping habits	32
66	Borrowed less than $10,000	31
67	Major change in church/club activities	26
68	Made new friends	25
69	Major change in type and amount of recreation	25
70	Minor law violations	25
71	Changed to an easier major	24
72	Took a vacation of at least one week	21
73	Dropped a course	19

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